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**U.S. AIR FORCE
AIRCRAFT
IN SOUTHEAST ASIA
TESTED BY
THE AIR FORCE
FLIGHT TEST CENTER**

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MICROFILMED BY ISAM

**EDWARDS AIR FORCE BASE
CALIFORNIA**

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USAF AIRCRAFT in
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Compiled by the
Historical Office
AIR FORCE FLIGHT TEST CENTER
Edwards AFB, California

March 1970

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FOREWORD

The following report of United States Air Force aircraft in Southeast Asia tested by, or at, the Air Force Flight Test Center goes a bit deeper than tests for limited war or counterinsurgency. It is felt that most of the tests conducted were made to determine the capability of the aircraft tested; for that reason, tests conducted prior to involvement of the aircraft in Southeast Asia are also included.

A few aircraft are included in this report that were not tested (according to available records) by, or at, the Air Force Flight Test Center. These few aircraft are, for the most part, older aircraft and are included to show that they had a part of the action in Southeast Asia.

U. S. Army helicopters used in Southeast Asia were tested at the Center by the U. S. Army Aviation Systems Test Activity. Support for these tests was provided by the Center as required.

When searching for information not available in histories of the Center, considerable assistance was provided by Mrs. Genevieve Cox of the AFFTC Technical Library, by personnel of the Plans and Requirements Office, the Comptroller Division, the 6512th Test Group, by Lt. Robert Butler and Mrs. Waller of the U. S. Army Aviation Systems Test Activity, and others at Edwards AFB. This assistance contributed significantly to this report and is greatly appreciated.

R.O'B

AVIATION HIGHLIGHTS
at the
AIR FORCE FLIGHT TEST CENTER

1 Oct 42	The first United States jet aircraft, the XP-59, serial number 42-108784, completed its maiden flight
2 Oct 42	First military flight was made with the XP-59A aircraft, Col. Lawrence Craigie was at the controls
15 Feb 43	Second XP-59A airplane arrived for testing, serial number 42-108785
25 Apr 42	Third XP-59A airplane, serial number 42-108786, had logged one hour and three minutes of flight
? Jul 43	First YP-59A airplane, serial number 42-108771, arrived for testing
26 Jul 43	An XP-59A airplane attained altitude of 45,765 feet
? Feb 44	Service tests with first YP-59A airplane completed (Note, somewhere near this date the P-80 aircraft arrived for testing)
16 Jun 45	Smithsonian Institution formally accepted delivery of the number 1 XP-59A aircraft
19 Jun 47	An FAI speed record over a three-kilometer course was established by Col. Albert Boyd in a P-80R airplane
14 Oct 47	First flight by man in excess of the speed of sound was made by Capt. Charles E. Yeager in the Bell X-1 rocket research airplane
21 Oct 47	The YB-49 Flying Wing completed its first flight
15 Sep 48	An FAI speed record of 670.981 m.p.h. was set by Maj. R. L. Johnson in an F-86 airplane
21 Oct 48	The XF-88 airplane made its initial flight
25 Jun 51	Air Force Flight Test Center was activated by the Air Research and Development Command
27 Jun 52	Bell Aircraft Company began glide flight testing of their X-2 rocket research airplane
20 Oct 52	A Douglas-built X-3 research airplane completed its first flight

9 Dec 52	An XF-91 rocket augmented jet airplane completed its first supersonic flight
25 May 53	The YF-100 Supersabre airplane made its initial flight at the Air Force Flight Test Center
24 Oct 53	The YF-102 Delta Dagger completed its maiden flight
4 Jun 54	The X-1A rocket research airplane set an altitude record of 90,000 feet piloted by Maj. Arthur Murray
28 Sep 54	The F-101 Voodoo made its initial flight
12 Oct 54	Construction completed on the 15,000-foot runway and dedication ceremonies held
22 Oct 55	An F-105 Thunderchief airplane, in its maiden flight at the Air Force Flight Test Center, exceeded Mach 1
18 Nov 55	The X-2 rocket research airplane made its first powered flight
10 Dec 55	The X-13 vertijet airplane made its initial flight
23 Apr 56	The C-133 Cargomaster airplane made its first flight at the Air Force Flight Test Center
7 Sep 56	The X-2 rocket research airplane, piloted by Capt. Iven C. Kincheloe, reached an altitude of 126,200 feet
26 Dec 56	An F-106 Delta Dart made its first flight at the Air Force Flight Test Center
12 Dec 57	An FAI speed record of 1,207.6 m.p.h. over a straight-away course was set by Maj. A. E. Drew in an F-101A airplane
7 May 58	An FAI altitude record of 91,243 feet was set by Maj. H. C. Johnson in an F-104A airplane
16 May 58	An FAI speed record in level flight over a 10-mile course of 1,404 m.p.h. was set by Capt. W. W. Irwin in an F-104A airplane
10 Mar 59	The X-15A-1 rocket research airplane made its first captive flight
8 Apr 59	An FAI speed record for 1,000 kilometers in closed circuit, without payload, of 700.047 m.p.h. was set by Col. E. H. Taylor in an RF-101C airplane

10 Apr 59 The T-38 Talon airplane completed its first flight at the Air Force Flight Test Center

15 Apr 59 An FAI speed record of 816.279 m.p.h. for a 500-kilometer closed circuit course, without payload, was set by Capt. G. A. Edwards Jr., in an RF-101C airplane

8 Jun 59 The X-15A-1 rocket research airplane made its first glide flight

30 Jul 59 The N-156F airplane made its initial flight

24 Nov 59 The X-18 tiltwing airplane completed its maiden flight

11 Dec 59 An FAI 100-kilometer closed circuit course speed record, without payload, of 1,167.35 m.p.h. was established by Brig. Gen. J. H. Moore in an F-105 airplane

15 Dec 59 An FAI speed record over a straight course of 1,525.965 m.p.h. was established by Maj. J. W. Rogers in an F-106 airplane

14 Dec 60 An FAI distance closed circuit record without refueling of 10,078.84 miles in 19 hours 44 minutes was established with a B-52G airplane. Lt. Col. T. R. Grissom and Capt. J. P. Bosley were the crew members

12 Jan 61 An FAI speed record for 2,000 kilometers, with and without payload, of 1,061.808 m.p.h. was set by Maj. H. J. Duetschendorf in a B-58 airplane

14 Jan 61 An FAI speed record for 1,000 kilometers, with and without payload, of 1,284.73 m.p.h. was set by Maj. H. E. Confer in a B-58 airplane

17 Apr 62 An FAI altitude record, with payload, of 47,171 feet was set by Maj. D. W. Craw in a C-135B airplane

17 Apr 62 An FAI speed record for 2,000 kilometers, with payload, was set by Maj. V. Hamann in a C-135B airplane

27 Jun 62 The X-15A-1 rocket research airplane reached a speed of 4,104 m.p.h. piloted by NASA test pilot Joseph A. Walker

17 Jul 62 The X-15A-3 rocket research airplane, piloted by Maj. Robert M. White, reached an altitude of 314,750 feet

19 Jul 62 Major White received the first Astronaut Wings for his altitude flight, 17 June 1962, in the X-15A-3 airplane

14 Sep 62	An FAI altitude record, with payload, of 85,360.8 feet was set by Maj. F. L. Fulton in a B-58 airplane
27 Jun 63	Major Robert A. Rushworth piloted the X-15A-3 airplane to an altitude of 295,000 feet, qualifying for his Astronaut Wings
18 Apr 63	The X-21A Laminar Flow Control airplane arrived at the Air Force Flight Test Center from Hawthorn, Calif., on its maiden flight
14 Aug 63	An F-5A multi-purpose fighter airplane made its first military flight
22 Aug 63	The X-15A-3, with NASA test pilot Joe Walker at the controls, reached an altitude of 354,200 feet
23 Oct 63	An F-4C airplane was ferried to the Air Force Flight Test Center to begin Category II Systems Evaluation testing
13 Dec 63	A YAT-37B counterinsurgency airplane arrived at the Air Force Flight Test Center to begin limited Category II/III tests
21 Apr 64	Performance testing of the CH-3E amphibious transport helicopter began
25 May 64	The XV-5A STOL airplane completed its first conventional flight at the Air Force Flight Test Center
21 Sep 64	The first XB-70A experimental airplane was flown from Palmdale Air Force Plant 42 to the Air Force Flight Test Center on its initial flight
12 Oct 64	The XB-70A airplane achieved supersonic flight for the first time
28 Feb 65	The first of five HC-130H Air Rescue Service airplanes arrived for six months of testing
1 May 65	Nine world records, approved by the FAI, were established with the YF-12A airplane
2 May 65	An F-111 variable sweep wing airplane arrived to begin a long period of testing
29 Jun 65	Capt. Joe H. Engle qualified for his Astronaut Wings when he piloted the X-15A-3 airplane to an altitude of 282,000 feet
9 Jul 65	The XC-142 tiltwing V/STOL transport airplane arrived to undergo extensive testing

14 Oct 65	The number 1 XB-70A airplane achieved its design speed of Mach 3
3 Jan 66	The number 2 XB-70A airplane achieved its design speed of Mach 3
18 Feb 66	The first Air Force flight of the Navy A-7A airplane was made
25 Feb 66	An F-111A airplane made a low level penetration flight at an altitude of 1,000 feet to Fort Worth, Texas, a distance of 1,045 nautical miles, non-stop
3 May 66	The first live ground-to-air pickup with an HC-130H airplane was successfully completed
1 Jul 66	The first of four U.S. Army CV-7 airplanes received at the Air Force Flight Test Center
12 Jul 66	NASA's M2-F2 lifting body made its first captive flight
15 Jul 66	An F-111A airplane achieved a speed of Mach 2.5
16 Nov 66	The X-15 rocket research airplane reached a speed of 4,159 m.p.h.
21 Aug 67	First flight of the X-15 with an ablative coating
4 Sep 67	The X-24A lifting body arrived at the Air Force Flight Test Center in a C-130 airplane
5 Oct 67	Maj. William Knight broke his speed record set 16 November 1967 in the X-15 by piloting the airplane to 4,500 m.p.h.
12 Oct 67	Major Knight qualified for his Astronaut Wings by taking the X-15 to an altitude of 277,000 feet
15 Mar 68	NASA's HL-10 lifting body was piloted on its first flight by Maj. Jerauld R. Gentry
4 Feb 69	The only remaining XB-70A airplane was flown to Wright-Patterson AFB, Ohio, where it will be placed in the Air Force Museum
4 Apr 69	The X-24A lifting body completed its first captive flight
17 Apr 69	Major Gentry completed the first glide flight in the X-24A

5 May 69	The number 1 X-15 rocket research airplane was sent to the Smithsonian Institution
4 Jun 69	The number 2 C-5A Galaxy airplane arrived at the Air Force Flight Test Center for joint Air Force/contractor testing
14 Jul 69	A joint Air Force/NASA program for continued research flights with the two YF-12A aircraft at the Air Force Flight Test Center was announced
17 Aug 69	A new world speed record for piston engine airplanes was established by civilian pilot Darryl Greenamyer over a three-kilometer course laid out on Roger Dry Lake
21 Aug 69	The first A-7D for testing was ferried to the Air Force Flight Test Center
21 Sep 69	The first Boeing 747 commercial transport arrived for final FAA certification tests
2 Oct 69	The first C-5A Galaxy for Air Force testing arrived at the Air Force Flight Test Center
14 Oct 69	A record takeoff weight of 798,200 pounds was set by the number 3 C-5A Galaxy flown by a contractor crew
11 Dec 69	First flight of the YF-12A airplane under the joint Air Force/NASA flight research program was made
3 Feb 70	A 10.5 hour endurance flight from the Air Force Flight Test Center to New York and return was completed with an A-7D airplane with one in-flight refueling
27 Feb 70	The first F-111E airplane arrived at the Air Force Flight Test Center for Category II testing
12 Mar 70	Two A-7D airplanes completed a 3,502 mile non-stop, unrefueled flight from the Air Force Flight Test Center to Homestead AFB, Fla.
20 Mar 70	The X-24A lifting body, piloted by Maj Jerauld R. Gentry, completed its first powered flight

U.S. AIR FORCE AIRCRAFT in SOUTHEAST ASIA

TESTED by the AIR FORCE FLIGHT TEST CENTER

Background

Prior to World War II, the area of Southeast Asia now known as Vietnam, North and South, was a part of the French colonial empire known as Indochina. The territory covered by the two countries began at the China border then, like the letter "J", encompassed a narrow strip of land on the east and south side of the peninsula extending into the South China Sea on the south, and the Gulf of Siam on the west (see map, Appendix A).

The northern part of the area, bordering the southern boundary of what is now Red China, experienced Communist activity as early as 1930. The southern area, now the Republic of Vietnam, was relatively peaceful under the French colonial government. With the invasion of this area by the Japanese forces following Pearl Harbor, French rule came to an end and whatever resources the land offered were enfolded into Japanese war activities. As the fortunes of war began to turn against the Japanese, the French resumed control of the area.

Weakened by six years of an exhaustive war, the French were not equipped to meet the outbreak of open rebellion in the northern part of Indochina. The rebellion was Communist oriented and was masterminded by Ho Chi Minh, long an advocate of Communism, and ably carried out by General Giap. As the rebellion in the north continued, considerable assistance was supplied by Red China in the form of supplies, equipment and manpower.

While the French were embroiled with the Communist-led Viet Minh, the United States contributed to the efforts of the French government to stabilize the political situation in Southeast Asia.¹ Following the defeat of the French forces at Diem Bien Phu in May 1954, and the agreement at Geneva, the United States Military Assistance Advisory Group (MAAG) became the only outside source of military aid for the South Vietnamese armed forces.²

The Geneva Agreement called for an end to all hostilities, a provisional division of the country at the seventeenth parallel, the withdrawal of opposing forces into the two zones created, and gave over the administration of the two zones to the parties withdrawing into them. The Communists quickly consolidated their control of the North under Ho Chi Minh. The turmoil in the South was compounded by the fleeing of a million refugees from the North to escape Communism, and the withdrawal of the French military forces.³

As Ho consolidated his control of the North, he recalled 80,000 of his Communist troops from the South.⁴ He was careful to leave a strong cadre of hard core Communists to foment discontent and disrupt a weak government. A government that was fragmented by rivalries of religious sects and powerful political factions.

The United States, France, Great Britain, Thailand, Pakistan, New Zealand, Australia, and the Philippines signed the Southeast Asia Collective Defense Treaty (SEATO) September 8, 1954, shortly after the Geneva Agreement. A protocol to the treaty included Laos, Cambodia, and South Vietnam under Articles III and IV, which provides for economic

and military assistance. The latter in case of armed attack or indirect attack and only at the invitation or with the consent of the government concerned.⁵ This treaty was supported by the United States Senate in February 1955 by a vote of 82 to 1.

In a letter to the President of Vietnam, October 1, 1954, President Eisenhower wrote⁶ that the policy behind the aid was "to assist the government of Vietnam in developing and maintaining a strong viable state, capable of resisting attempted subversion or aggression through military means."

In his Inaugural Address, President Kennedy said⁷, "Let every nation know, whether it wishes us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe, to assure survival and the success of liberty...."

From 1954 to 1960, the Viet Cong concentrated its efforts to establish guerrilla cadres throughout the rural areas of South Vietnam. A widespread propaganda campaign was initiated to overthrow the new government and, following the elections of 1959, the Viet Cong activity increased.⁸ By 1959, following five years of clandestine preparation and activity, the Communists in the North came into the open with their calculated program of aggression against the people of the South. The Lao Dong (Communist) Party in Hanoi announced that the time had come to "liberate" the South.⁹

Following the general elections in April 1961, despite efforts of the Viet Cong to prevent them, heavier infiltrations of guerrillas from the North began.

The United States Military Assistance Command was established in 1962 at the request of the South Vietnam Government.¹⁰ Fighter pilots

were trained and equipped, first with AD-6* and T-28 aircraft and, later, the first full squadron of A-1H Skyraiders was delivered to the Vietnam Air Force.¹¹ Except for cargo and transport activity, the aircraft mentioned were the only United States aircraft used in Vietnam during the early part of the build-up period. Later, expanded training included aerial supply, psychological warfare, low-level navigation, and night flare-drops. For the training of Republic of Vietnam (RVN) paratroops, the C-47 and U-10 aircraft were brought in.

August 2 and 4, 1964, United States destroyers were attacked in international waters off the Vietnam coast by North Vietnam torpedo boats. During the same period, intelligence was accumulating information which proved the presence of regular North Vietnam battle units in South Vietnam. President Johnson, in a message to Congress August 5, 1964, asked for a resolution "expressing the unity and determination of the United States in supporting freedom and protecting peace in Southeast Asia." The Congress passed such a resolution by a vote of 88 to 2 in the Senate, and 416 to 0 in the House of Representatives.¹²

February 8, 1965, the first air strikes were made in North Vietnam with F-100 Supersabres, and B-57 light bombers. The F-105 Thunderchief joined what was to be a parade of United States aircraft operating in Southeast Asia March 2. The B-52 Stratofortress made the first bombing run June 18, 1965, and it was July 10 when the first air-to-air combat occurred. F-4C Phantom II aircraft met the MIG-17s and two of the three MIGs were shot down. During the same month, the F-102 Delta Daggers arrived on the scene and, in October, the F-5 Freedom Fighters became

* - later, designated the A-1H

involved.¹³ It was not until March 17, 1968, that the newest weapons system in the United States Air Force inventory, the F-111, arrived in Southeast Asia.¹⁴

In an article recently published, Major General Harry E. Goldsworthy, then the commander of the Air Force Systems Command's Aeronautical Systems Division, wrote:¹⁵

...In the early 1960s the unfolding Vietnam struggle showed that even in a nuclear era, war could take many forms and could be fought for specific and localized objectives. Nevertheless, U. S. ability to cope with limited war -- from both the doctrinal and actual military points of view -- was questionable. Such lessons had to be learned, but they were learned quickly.

Several of the solutions for the lessons learned came from tests performed with aircraft at the Air Force Flight Test Center. Almost every aircraft used by the Air Force in Southeast Asia was, at one time or another, tested by the Center's test pilots. Tests were made to determine if the aircraft met the Government's specifications and to prove the aircraft's capabilities. Some of the tests were conducted to determine the aircraft's capabilities for limited war use, and for those special conditions encountered in Southeast Asia. A few of the aircraft tested were ancient, but reliable vehicles, such as the C-47, T-37 and C-119, modified for a new role to meet new conditions of limited warfare.

In the list, to follow, of aircraft and the various tests conducted with them, the tests are divided into two periods. The 1952 through 1964 period, which may be considered the pre-Southeast Asia period, and from 1965 through the present (early 1970). Test results during the first period were published in a Technical Documentary Report (TDR) and addenda or supplements. Test results during the second period were published in

Technical Reports (TR) and, more recently, some of the reports were enlarged upon by the publication of Supplementary Documents (SD) and Technology Documents (TD). Recently, Progress Reports were published at regular intervals on tests of aircraft which required more extensive testing, such as the F-111, the F-4, and the A-7D. Copies of all reports published by the Air Force Flight Test Center are maintained at the Center's Technical Library, Edwards AFB, and at the Defense Documentation Center, Alexandria, Virginia.

Aircraft in the following compilation are listed numerically according to design number, beginning with the lowest number. Because of this, some of the newer aircraft will be found near the beginning of the list. This listing by design number, rather than by the basic mission, was selected due to some of the aircraft being modified out of their basic mission. For those who may be unfamiliar with military aircraft designations, an explanation of the designations will be found under Appendix B.

A-1E Skyraider

The Skyraider is a modified AD-5 Navy aircraft used in special air warfare for day and night tactical missions, including reconnaissance. Built by the Douglas Aircraft Company and powered by a Wright R3350-26WA/WP piston engine, the Skyraider has a span of 50 feet, is almost 39 feet long, and about 15 feet high. Speed is approximately 280 mph, ceiling is above 25,000 feet, and range is beyond 2,700 miles.

Manned by a crew of two in side-by-side seats, the A-1E was used extensively by USAF special operation squadrons and RVN pilots in SEA. Armament included four 20mm wing-mounted cannons and 14 external under-wing bomb racks. The Skyraider was the mainstay of the RVN Air Force.

Records do not reveal that there was any testing of the A-1 aircraft at the Air Force Flight Test Center.

O-1 Bird Dog

Built by Cessna Aircraft Company, the Bird Dog was formerly known as the L-19A. The E and G series are powered by a Continental O-470-1 engine with fixed pitch propeller; the F series is powered by a Continental O-470-15 engine with constant speed propeller. The three series were used extensively by the USAF, U.S. Marines, and the U.S. Army in Southeast Asia. The primary Air Force use was for forward air controller (FAC) functions.

The O-1 has a span of 31 feet, is almost 26 feet in length, and is 7 1/3 feet high. Speed is approximately 100 mph, ceiling is above 18,000 feet, and the range is beyond 300 miles. The Bird Dog can carry four rockets under each wing and, at night, two million-candlepower flares. Smoke rockets are used when the O-1 is assigned FAC missions. It requires a crew of one.

Records do not reveal any testing of the O-1 aircraft at the Air Force Flight Test Center. However, an XL-19B and an XL-19C airplane underwent Phase II flight testing; the former during the early part of 1953 and the latter about a year later. The tests were conducted by a flight test pilot and a flight engineer from the Center at the Cessna facility in Wichita, Kansas. Test results were published in the following reports:

TDR-53-20, dated July 1953, title:
Phase II Flight Test of the XL-19B

TDR-54-9, dated April 1954, title:
Phase II Flight Test of the XL-19C Aircraft USAF s/n 52-6311

The U.S. Army conducted a test with the L-19A aircraft and the results were published in the following report:

Aviation Test Office TR-61-1, dated February 1961, title:
Evaluation of L-19A Equipped with Continental O-470-11C1
Fuel Injection Engine

O-2

The primary function of the O-2 aircraft is to serve on forward air controller (FAC) and psychological warfare (psywar) missions. The O-2 is a military version of the Cessna Model 337 Super Skymaster, and is powered by two Continental IO-360 engines. It is a high-wing, all-metal, twin-boom aircraft.

The unusual centerline mounting of the engines with a tractor and pusher propeller arrangement provides twin-engine safety and reliable handling characteristics, and it is easier to fly than a conventional twin-engine aircraft. The engines are interchangeable, but the propellers are not. The O-2 has a span of 38 feet, is almost 30 feet long, and is 9 1/3 feet high. Its speed is from 80 to 200 mph, ceiling is 18,000 feet and it has a range of up to 1,300 miles; it can takeoff and land in less than 1,000 feet.

A crew of one or two can operate the O-2 from the dual, side-by-side controls; two passengers can be accommodated, or about 700 pounds of cargo. The O-2A is an FAC version and is equipped with four pylons on the wings to carry rockets, flares and other light ordnance. The O-2B version is a psywar aircraft and is equipped with a loudspeaker, tape recorder and leaflet dispensing chute.

Two tests were conducted with the O-2 aircraft at the Air Force Flight Test Center during the period of 9 May 1967 and 16 April 1968. The following Technical Reports were published:

TR-67-34, dated May 1968, title:

O-2A Limited Category II Systems Evaluation

Test Authority: PD 67-65A, dated 27 February 1967

Test Aircraft: O-2A s/n 67-21296

Test Period: 9 May - 1 September 1967

Test Hours: 108.2

Test Missions: 76

TR-68-15, dated March 1969, title:

Category II Performance and Qualitative Stability and Control

Tests of the O-2A Aircraft

Test Authority: PD 67-65A, dated 27 February 1967

Test Aircraft: O-2A s/n 67-21299

Test Period: 21 July 1967 - 16 April 1968

Test Hours: 149.3

Test Missions: 103

WU-2

The primary function of the WU-2 aircraft, better known as the U-2, is high altitude weather reconnaissance. A product of Lockheed Aircraft Corporation, the WU-2 is powered by a Pratt & Whitney J75-P-13 turbojet engine with approximately 17,000 pounds of thrust.

The ability of the WU-2 to maintain high altitudes for long periods of time compensate for its relatively low speed of 430 mph. Its ceiling is above 70,000 feet, and it has a range beyond 3,000 miles. The WU-2 requires a crew of one, and the D series requires a crew of two.

WU-2 has a span of 80 feet, a length of 49 feet 7 inches, and it is 13 feet high. The wide, straight wings increases the load capacity to accommodate data-collection instruments.

There is no record of testing the WU-2 at the Air Force Flight Test Center.

U-3

This Cessna Aircraft Company airplane was formerly known as the L-27A. The U-3 is powered by two Continental O-470-M engines, and the U-3B by two Continental IO-470-D engines. The aircraft has a span of 36 feet, is almost 30 feet long, and is 10 feet high. The B series has more powerful engines and features a sweptback vertical tail. The U-3's civilian counterpart is the Cessna 310.

The U-3 meets the Air Force need for a low-cost and medium maintenance administrative and light cargo aircraft. It has a speed of 240 mph, ceiling is above 21,000 feet, and the range is beyond 1,100 miles. Besides a crew of two, the U-3 can accommodate three passengers.

The L-27A aircraft underwent testing at the Air Force Flight Test Center and two Technical Documentary Reports were published:

TDR-57-26, November 1957, title:
L-27A Phase VI Functional Analysis

TDR-58-8, April 1958, title:
L-27A Phase IV Performance

F-4 Phantom II and RF-4

Originally a Navy aircraft, the F-4 was modified with larger wheels, brakes, tires, and cartridge starters to meet Air Force requirements. The F-4's primary function is that of an all-weather fighter-bomber, and the RF-4 is for tactical reconnaissance. Built by McDonnell Aircraft Corporation, the F-4 is powered by two General Electric J79-GE-15 turbojet engines with afterburners. However, the F-4E has an advanced version of the J79 engine.

The F-4 has a span of 38 feet 11 inches, its length is 54 1/4 feet, and the height is 16 1/4 feet. Speed is in excess of 1,600 mph, ceiling is above 60,000 feet, and the range is beyond 1,600 miles. A bomb load of 14,000 pounds can be carried, including Bullpup, Sidewinder, Falcon, Sparrow III, and other weapons, both nuclear and non-nuclear. Vulcan 20mm cannons are pod-mounted on the C and D series and internally on the E series. The RF-4 carries no munitions.

The RF-4 has a longer nose than the F-4 to accommodate cameras and related equipment, and has optical, infrared and electronic sensors for all-weather or night reconnaissance missions. Electronic equipment is also installed for ground mapping and low-level penetration reconnaissance.

The Phantom II has undergone extensive testing at the Air Force Flight Test Center. Early reports of F-4 testing were concerned with the C series; tests just recently completed were with the E series.

Technical Reports published include the following:

TR-65-30, dated December 1965, title:

F-4C Category II Stability and Control Test

Test Authority: PD 64-42, dated 16 December 1963

Test Aircraft: F-4C s/n 63-7409, a production model

Test period: 19 August 1964 - 12 April 1965

Test Hours: 41
Test Missions: not indicated

TR-65-41, dated January 1966, title:
F-4C Category II Performance Test
Test Authority: PD 64-41, dated 16 December 1963
Test Aircraft: F-4C s/n 63-7409
Test Period: 17 January 1964 - 12 April 1965
Test Hours: 117
Test Missions: 107

TR-66-41, dated August 1967, title:
F/RF-4C Standard Airspeed Calibrations
(These tests flown in conjunction with those reported
in TR-65-30 and TR-65-41)

TR-67-9, dated September 1967, title:
F-4C Stability and Control Tests with TAC Training Loading
Test Authority: ASD message number 29585
Test Aircraft: F-4C s/n 63-7409
Test Period: 16 February - 13 March 1967
Test Hours: 8:15
Test Missions: not indicated

TR-67-19, dated December 1967, title:
Evaluation of Longitudinal Control Feel System Modifications
Proposed for USAF F/RF-4 Aircraft
Test Authority: Part of the Follow-On Program
Test Aircraft: F-4C s/n 63-7409
Test Period: 22 June - 14 July 1967
Test Hours: 13
Test Missions: 13

TR-67-26, dated May 1968, title:
F-4C Category II Follow-On Stability and Control Tests
Test Authority: F/RF-4 Project Office, Aeronautical Systems
Division, message number 92361, December 1965
Test Aircraft: F-4C s/n 63-7409
Test Period: 29 December 1966 - 20 June 1967
Test Hours: 31:25
Test Missions: 31

TR-69-9, dated September 1969, title:
Stability and Control Derivatives for the F-4E Aircraft
Test Authority: not available
Test Aircraft: various
Test Period: 1 February 1968 - 13 June 1969
Test Missions: 74

TR-69-14, dated April 1969, and SD-69-14, dated July 1969, title:
Category II Stability and Control Evaluation of the F-4E Aircraft
 Test Authority: PD-66-59A, dated 24 May 1967
 Test Aircraft: F-4E s/n 66-287A
 Test Period: 1 February 1968 - 8 April 1969
 Test Hours: 77
 Test Missions: 65

TR-69-21, dated June 1969 and SD-69-21, dated August 1969, title:
F-4E Category II Performance Test
 Test Authority: PD 66-59A, dated 24 May 1967
 Test Aircraft: F-4E s/n 66-278A
 Test Period: 1 January 1968 - 22 May 1969
 Test Hours: 83
 Test Missions: 77

TR-69-25, dated July 1969, title:
Evaluation of Modifications to Balance and Overbalance the
 Longitudinal Control System of the F-4E Aircraft
 Test Authority: PD 66-59A, dated 24 May 1967
 Test Aircraft: F-4E s/n 66-278A
 Test Period: 10 April - 13 June 1969
 Test Hours: not available
 Test Missions: 19 plus two static ground tests

The following reports of tests conducted with the F-4 airplane are
 classified, however the title of the report is not classified:

TR-65-18, dated January 1966, title:
F-4C Category II Systems Evaluation

TR-66-18, dated September 1966, title:
F-4C Hill Genie Tests

TR-69-30, dated August 1969, title:
F-4E Category II Systems Evaluation

F-4E Category II Progress Report, 1 November - 31 July 1968

Revision #1, 1 August - 31 October 1968
 Revision #2, 1 August 1968 - 1 January 1969
 Revision #3, 1 August 1968 - 1 March 1969
 Revision #4, 1 August 1968 - 1 April 1969
 Revision #5, 1 August 1968 - 1 May 1969
 Revision #6, 1 August 1968 - 1 June 1969

F-4E Category II Follow-On Progress Reports:

Progress Report #1, July 1969
 Progress Report #2, August 1969
 Progress Report #3, September 1969
 Progress Report #4, October 1969
 Progress Report #5, November 1969
 Progress Report #6, December 1969
 Progress Report #7, January 1970

RF-4 Testing (not classified):

TR-65-40, dated January 1966, title:

RF-4C Category II Performance and Stability Tests
 Test Authority: PD 63-32B, dated 16 December 1963
 Test Aircraft: RF-4C s/n 63-7743
 Test Period: 2 November 1964 - 4 June 1965
 Test Hours: 91
 Test Missions: 73

TR-66-6, dated July 1966, title:

RF-4C Wet Runway Performance
 Test Authority: PD 63-32B, dated 16 December 1963
 Test Aircraft: RF-4C s/n 63-7743
 Test Period: 14 July - 22 November 1965
 Test Hours: Not available
 Test Missions: 45; 33 refused takeoff, 12 landings

TR-66-28, dated November 1966, title:

F-RF-4C Category II Drag Data

	<u>F-4C</u>	<u>RF-4C</u>
Test Authority:	PD 64-42, 16 Dec 1963	PD 63-32B, 16 Dec 1963
Test Aircraft:	F-4C s/n 63-7409	RF-4C s/n 63-7743
Test Period:	17 Jan 64 - 12 Apr 65	2 Nov 64 - 4 Jun 65
Test Hours:	117	91
Test Missions:	107	73

TR-67-19, see under F-4 tests

F-5 Freedom Fighter

Designed for close ground support, interception of enemy aircraft, interdiction missions and reconnaissance, the F-5 is a twin turbojet supersonic fighter selected by the Department of Defense for aircraft replacements in allied nations as a part of the U.S. Military Assistance Program (MAP). Similar in design to the Air Force T-38 supersonic trainer, the F-5 has a span of more than 26 1/2 feet, is 45 feet long and 13 feet 2 inches high.

The Northrop Corporation is the prime contractor for the F-5, and it is supplied with a powerplant of two General Electric J85-GE-13 engines with afterburners. It has a speed of 1,000 mph, ceiling is over 50,000 feet, and it has a range (with external tanks) of more than 1,300 miles. The F-5 can carry a bomb load of up to 6,200 pounds, and armament includes the Sidewinder or Bullpup missiles, 2.75-inch, 5-inch or Zuni rockets or napalm canisters, and two M-29 29mm cannons. A crew of two is required in the B series (combat tactical trainer), but only one is required with the A series.

The Freedom Fighter can operate from short, unimproved airstrips in forward battle areas, and all systems and components have ground-level accessibility. The RVN Air Force formally accepted the F-5A as its first jet aircraft June 1, 1967.

Another airplane very similar to the F-5 was the Northrop-built N-156F; this airplane underwent a short period of testing at the Air Force Flight Test Center during the latter part of 1959. A Technical Documentary Report (TDR-62-5) "Final Report on Limited Performance Evaluation of the Norair N-156F with J85-GE-5 Engines" was published during March 1962.

The first F-5 aircraft accepted by the Air Force for Category II testing was s/n 63-8337, and testing began February 1, 1964. Performance, stability and control testing began April 30, 1964 with another aircraft, F-5A s/n 63-8438. Following are the Technical Reports on F-5 testing at the Air Force Flight Test Center:

TR-65-3, dated June 1965, title:

F-5A/B Systems Evaluation

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: 2 NF-5As, 1 F-5B, 2 F-5As: s/n N/A

Test Period: 13 March - 31 October 1964

Test Hours: 843

Test Missions: 757

TR-65-6, dated June 1965, title:

F-5A Category II Stability and Control Test

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: YF-5A s/n 59-4989

Test Period: 24 January 1964; 18 August - 4 September 1964;
24 September - 2 October 1964

Test Hours: 25:30

Test Missions: 29

TR-65-7, dated June 1965, title:

F-5B Category II Performance Test

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: F-5B s/n 63-8438

Test Period: 30 April - 8 June 1964

Test Hours: 47

Test Missions: 37

TR-65-8, dated July 1965, title:

F-5B Category II Stability and Control Test

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: F-5B s/n 63-8438

Test Period: 15 June - 15 September 1964

Test Hours: 20

Test Missions: N/A

TR-65-15, dated July 1965, title:

F-5A Category II Performance Tests

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: F-5A s/n 63-8367

Test Period: 5 February - 21 October 1964

Test Hours: 161:25

Test Missions: 159

TR-65-22, dated August 1965, title:

F-5N Limited Flight Evaluation

Test Authority: Unknown

Test Aircraft: F-5N s/n 63-8421

Test Period: 9 June - 15 June 1965

Test Hours: 7

Test Missions: 8

TR-65-34, dated February 1966, title:

F-5A Category II Follow-On Performance Tests

Test Authority: PD 65-39, dated 23 December 1964

Test Aircraft: F-5A s/n 63-8367

Test Period: 8 January - 31 August 1965

Test Hours: 33

Test Missions: 34

TR-65-35, dated December 1965, title:

F-5 Follow-On Systems Evaluation Tests

Test Authority: PD 65-39, dated 23 December 1964

Test Aircraft: NF-5A s/n 63-8367

Test Period: 1 January - 14 September 1964

Test Hours: 92

Test Missions: 12

TR-65-36, dated April 1966, title:

F-5A Category II Supplementary Stability and Control Test

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: F-5A s/n 63-8372

Test Period: 12 July - 13 August 1965

Test Hours: 34:15

Test Missions: 33

TR-66-8, dated May 1966, title:

F-5A Category II Drag Data

Test Authority: PD 64-40, dated 3 December 1963

Test Aircraft: F-5A s/n 63-8367

Test Period: 5 February - 21 October 1964

Test Hours: 161:25

Test Missions: 159

TR-68-24, dated March 1969, title:

Limited Category II/III Evaluation of MAP RF-5A Photoreconnaissance

Test Authority: PD 67-24, dated 27 November 1967

Test Aircraft: RF-5A s/n 67-21219

Test Period: 1 July - 28 August 1968

Test Hours: 58.8

Test Missions: 47

A-7 Corsair II

The A-7D is a single place light attack aircraft for tactical strike, interdiction missions and close support. It is a modified version of the Navy A-7A, and can be used in situations requiring a high degree of fire power against ground targets in close support of ground operations where enemy air operation is non-existent or not a serious threat.

Ling-Temco-Vought, Inc., is the prime contractor, and the A-7D is powered by an Allison TF41-A-1 (Sprey) engine. The Corsair has a span of 39 3/4 feet, length of 45 feet, and a height of 16 feet. Speed is more than 550 mph, and the range is beyond 2,000 miles with internal fuel supply.

The A-7D can carry a bomb load of 15,000 pounds, and armament consists of air-to-surface missiles, bombs, rockets and other conventional munitions, Sidewinders, and 20mm cannons. It requires a crew of one.

Testing of this aircraft at the Air Force Flight Test Center did not begin until after mid-1969, following the arrival of the first A-7D (article 7) from the contractor's facility at Dallas, Texas. Earlier, evaluation tests of the Navy A-7A were made at the contractor's facility and at Carswell AFB, Texas, by a joint Air Force and Navy test force. During mid-1968 this same joint test force participated in tests of the A-7D aircraft at the contractor's facility. The first A-7D aircraft for testing arrived at the Air Force Flight Test Center August 21, 1969.

Following is a list of Technical Reports on the test activities at the contractor's facility and Carswell AFB. Only progress reports were issued covering the most recent tests at the Center.

TR-66-19, dated September 1966, title:
Initial Air Force Flight Evaluation of the A-7A

(The above report is classified, however the title is not classified)

TR-68-1, dated March 1968, title:
A-7A Limited Handling Qualities Evaluation
 Test Authority: At request of Lt Gen C. H. Terhune, AFSC
 deputy commander
 Test Period: 10 October then 24 - 27 October 1967
 (The test aircraft, flight test hours and missions not available)

TR-69-5, dated April 1969, title:
A-7D Stability and Control Military Preliminary Evaluation
(Phase 1A and 1B)
 Test Authority: PD 68-52, dated 20 February 1968
 Test Aircraft: A7D s/n 67-14582

	<u>Phase 1A</u>	<u>Phase 1B</u>
Test Period:	24 June - 5 July 1968	19-23 August 1968
Test Hours:	23.6	19.4
Test Missions:	12	9

TR-69-7 and SD-69-7, dated May 1969, title:
A-7D Performance Military Preliminary Evaluation
 Test Authority: PD 68-52, dated 20 February 1968
 Test Aircraft: A-7D s/n 67-14584
 Test Period: 16-23 January 1969
 Test Hours: 14.3 plus 3.7 hours for VTF41-A-1 engine
 Test Missions: 9

TR-69-22, dated May 1969, and SD-69-22, May 1969, title:
A-7D Stability and Control Military Preliminary Evaluation
(Phase 1C)
 Test Authority: PD 68-52, dated 20 February 1968
 Test Aircraft: A-7D s/n 67-14582 with Allison YTC41-A-1
 engine and refueling probe reinstalled
 Test Period: 12-24 February 1969
 Test Hours: 12.4
 Test Missions: 6

Progress Reports, title:
A-7D Category II Systems and Performance Evaluation

	<u>Flight Test</u>	
	<u>Hours</u>	<u>Missions</u>
Progress Report #1, 21 Aug - 10 Oct 1969	68.2	34
Progress Report #2, 11 Oct - 10 Nov 1969	49.3	28
Progress Report #3, 11 Nov - 10 Dec 1969	48.9	28
Progress Report #4, 11 Dec 69 - 10 Jan 70	95.1	36
Progress Report #5, 11 Jan - 10 Feb 1970	96.5	46
Test Authority: PD 68-52, dated 20 Feb 1968		
Test Aircraft: A-7D s/n 68-8223 and 68-8224 for systems		
A-7D s/n 68-8221 for stability and control		

C-7 Caribou

The C-7A entered the USAF inventory of cargo/transport aircraft as the result of an agreement between the U.S. Army and the Air Force in April of 1966. Its short takeoff and landing (STOL) characteristics make it a suitable aircraft for airlift in forward battle areas, or on short or unimproved airstrips.

Prime contractor for the Caribou is DeHavilland Aircraft of Canada, Ltd., and the powerplant is two Pratt & Whitney reciprocating engines with 1,450 horsepower each. The C-7 has a span of 95 feet 7 1/2 inches, length is 72 feet 7 inches, and it is 31 2/3 feet high. Speed is 180 mph, ceiling is 24,800 feet, and the range is beyond 1,250 miles. The Caribou requires a crew of three.

During early 1960, a series of tests were carried out with a DeHavilland YAC-1, s/n 57-3079, built for the U.S. Army, a prototype of the present C-7, and the following report was published:

TDR-60-41, dated December 1960, title:
YAC-1DH Category II Performance, Stability Tests

A performance evaluation of the C-7A was completed February 2, 1970 and the following report published:

TR-70-5, dated March 1970, title:
C-7A Performance Evaluation
Test Authority: PD 70-1, dated 24 July 1969
Test Aircraft: C-7A s/n 60-5432
Test Period: 16 October 1969 - 2 February 1970
Flight Test Hours: 61
Flight Test Missions: 37

OV-10 Bronco

Originally a U.S. Navy aircraft, the OV-10 was built by North American Aviation, Columbus (Ohio) Division, and is powered by two Garrett-AiResearch T76-G-10/10 turboprop engines. The Air Force version of this light, armed reconnaissance aircraft has a span of 30 1/4 feet, length of 40 feet 11 inches, and is 15 feet 1 inch high. Speed is more than 300 mph, ceiling is above 18,000 feet, and the range is beyond 1,000 miles.

This airplane has many configurations to meet various counterinsurgency missions. The Bronco has places for one to six crew members depending on the configuration.

Testing the Bronco was a joint Air Force and Navy effort during the first half of 1966; test pilots from the Air Force Flight Test Center and the Naval Air Test Center conducted tests with an YOY-10 at Patuxent River, Maryland, and at the contractor's facility near Columbus, Ohio. The YOY-10 was built with a 40-foot wing, later tests were flown with an aircraft with a 34-foot wing, the production prototype of the OV-10A.

The following two test reports were published by the Naval Air Test Center:

Naval Air Test Center Technical Report FT-49R-66, 31 May 1966:
Phase I Navy Preliminary Evaluation of the OV-10A Airplane
Test Authority: Bureau of Weapons Systems Problem Assignment
RA361-513, dated 10 November 1965
Test Aircraft: OV-10A Bu No 152879 and 152881
Test Period: 1-21 March 1966
Test Hours: 76.7
Test Missions: 40

Naval Air Test Center Technical Report FT-72R-66, 1 August 1966:
Phase IA Navy Preliminary Evaluation of the OV-10A Airplane
Test Authority: Naval Air Systems Command Headquarters
problem Assignment RAD3211-593, 26 May 1966
Test Aircraft: OV-10A Bu No 152883
Test Period: 5-9 July 1966
Test Hours: 17.3
Test Missions: 10

A "quick look" evaluation of the OV-10 short takeoff and landing performance was held at the Air Force Flight Test Center from 23 to 28 September 1968. The authority for this test was Project Directive 69-27, dated 29 September 1968; aircraft used was a Tactical Air Command OV-10A, s/n 66-13555. The test included six flights and 11:45 hours of flight test time. A letter report was prepared at the Center.

From July 29 to August 3, 1968, hot day takeoff tests and store drag determination flights were flown at El Centro, California; high altitude takeoff tests were flown near Denver, Colorado, August 10 to 14, 1968. Bureau of Inspection and Survey (BIS) tests for performance, stability and control began August 30 and continued into October. During September 1968 an OV-10 test pilot from the Center arrived in South Vietnam to assist Tactical Air Command with the evaluation of the Bronco under actual combat conditions, a project known as Combat Bronco.

Except for the letter report, no other report was published by the Center on tests conducted.

U-10

The U-10 is a high-wing, all-metal monoplane originally designed as the L-28 executive aircraft. The commandos have named it the "Super Spad" after the famed World War I airplane. Manufactured by the Helio Aircraft Corporation, the A and B series are powered by a Lycoming G-48-G1D6 engine, and the C series by a Lycoming GSO-450 engine.

The U-10 performs excellently on reconnaissance and small supply-drop missions, and can land and takeoff in any clearing the size of a football field. It has a span of 39 feet, length of 30 feet, and is 8 feet 10 inches high. Its ceiling is above 16,500 feet; it can fly at slow speeds and up to 170 mph, and the range is beyond 1,000 miles. With a crew of two, the U-10 can accommodate three passengers.

During 1959, a flight evaluation program was flown at the Air Force Flight Test Center with the L-28A airplane and, later, one test was flown with the U-10 airplane. Reports published are listed below:

TDR-59-38, dated January 1960, title:
L-28A Air Force Flight Evaluation

TDR-64-38, dated November 1964, title:
High Altitude Takeoff Tests

HU-16 Albatross

A twin-engine amphibious aircraft formerly designated the SA-16 was first flown in 1947. The Albatross can land on water, ice, snow or land, and is equipped with JATO (jet-assisted takeoff) bottles to become airborne in seconds.

Manufactured by the Grumman Aircraft Engineering Company, the HU-16 is powered by two Wright R1820-76A or B piston engines with 1,425 horsepower each. The wing span of the HU-16 was increased 16 1/2 feet over the span of the SA-16 to provide stability in the air and on water. HU-16 dimensions are; span, 80 feet; length, 62 feet 1 inch; height 24 1/3 feet. The Albatross has a speed of 230 mph, ceiling is above 24,000 feet, and the range is beyond 2,400 miles. The A series uses a crew of four, and the B series a crew of five.

The primary function of the Albatross is air search and rescue, and it was responsible for many hazardous and dramatic rescues in Korea and Vietnam. The aircraft is being phased from the inventory of the active Air Force.

The SA-16 aircraft was tested at the Air Force Flight Test Center during the first half of 1957; there were no tests recorded for the HU-16.

TDR-57-16, dated October 1957, title:

Limited Phase IV Stability, Control and Performance Test of
SA-16 Aircraft

A-26 Invader

The Invader is a refurbished and converted B-26 bomber which first saw action during the closing months of World War II. Its primary function, as the A-26, is for special air warfare as a counterinsurgency aircraft. A product of the Douglas Aircraft Company, the A-26 is powered by two Pratt & Whitney R-2800-PW-52W piston engines.

The A-26 has a 70-foot span, is 51 1/4 feet long, and is 18 feet five inches high. It has a speed of 361 mph, a ceiling above 20,000 feet, and a range beyond 2,400 miles. Eight .50 caliber machineguns are mounted in the nose, and it has a 12,000 pound capacity for bombs. A crew of two is required.

No testing of the A-26 per se by the Air Force Flight Test Center appears in the Center's records.

B-26 Invader

The modified B-26 returned to operational status in 1961 with the Special Air Warfare Center, Eglin AFB, Florida. It is a visual day-night tactical bomber used by air commandos for close support, reconnaissance (RB-26), and interdiction missions. It is the oldest Air Force propeller driven light bomber in the active inventory.

Built by Douglas Aircraft Company, the Invader is powered by two Pratt & Whitney R-2800-PW-79 piston engines, each producing 2,000 horsepower. Speed is about 350 mph, ceiling is above 20,000 feet, and the range is beyond 2,400 miles. Armament consists of eight .50 caliber machineguns in the nose. Externally it can carry rockets, napalm and bombs. A crew of three or four is required, according to mission. Dimensions are the same as the A-26, see above.

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Two tests were conducted with a B-26K airplane at the Air Force Test Flight Center during 1964. The B-26K was a modification of the B-26A/B series for use as a photo reconnaissance airplane with a quick-change gun nose or camera nose. The published reports of the two tests are shown below:

TR-65-13, dated September 1965, title:

Functional Evaluation of the B-26K
Photo Reconnaissance System

Test Authority: 65-18, dated 25 August 1964

Test Aircraft: B-26K s/n 64-17640

Test Period: 14 December - 23 December 1964

Test Hours: 12:20

Test Flights: 10 (four were night flights)

TR-65-29, dated December 1965, title:

B-26K Category II Performance and Qualitative
Stability and Control Tests

Test Authority: PD 64-21, dated 7 October 1963

Test Aircraft: B-26K s/n 64-17640

Test Period: 23 June - 21 December 1964

Test Hours: 266:15

Test Flights: 124

T-28 Trojan

The T-28A is, primarily, a pilot trainer for the Military Assistance Program (MAP), and the T-28D's primary function is to serve as a special air warfare aircraft. The D series is used by the Air Force in air commando units in special warfare as a light tactical aircraft, also as a trainer. The Trojan is a product of North American Aviation, Inc., and is powered by a Wright R2300-1A piston engine; the T-28D is powered by a Wright R1820-86A engine.

The T-28D has a span of 40 feet 7 inches, is 33 feet in length, and 12 3/4 feet high. Speed is approximately 195 mph, ceiling is above 16,500 feet, and the range is beyond 1,400 miles. Armament consists of two .50 caliber machineguns and 3,500 pounds of ordnance. It requires a crew of two, pilot and observer. The T-28 is often called the Nomad.

Early tests conducted at Edwards Air Force Base were with the experimental T-28, the XT-28. These tests were made with XT-28 s/n 48-1371 and began April 12, 1950. The flying portion of testing ended May 24, 1951, just three days after the designation of the Air Force Flight Test Center. When the technical report was published it appears that the "X" was omitted from the aircraft designation in the title.

The following technical reports were published on T-28 tests:

TDR-51-16, dated January 1952, title:

Phase IV Flight Test of the T-28 Airplane 48-1371

TDR-52-A, dated August 1952, title:

Performance Flight Test of the North American Airplane USAF No. 49-1469

TDR-64-22, dated August 1964, title:

YAT-28E Limited Category II Systems Evaluation

TDR-64-39, dated February 1965, title:

YAT-28E Limited Category II Performance, Stability and Control Tests

T-33 T-Bird

The T-Bird made its first flight in 1948. It is a trainer version of the F-80, the first U.S. jet fighter used in combat. The F-80 (first called the P-80) underwent extensive testing at the Muroc Flight Test Base during the mid and late 1940s.

Built by Lockheed Aircraft Corporation, the T-33 has an Allison J33-A-35 turbojet engine with a thrust of 5,200 pounds. The T-Bird has a span of 37 1/2 feet, length of 37 2/3 feet, and is 11 feet 7 inches high. Speed is about 600 mph, ceiling is above 45,000 feet, and the range is beyond 1,000 miles. Two .50 caliber machineguns comprise the armament, and that is optional.

The first T-33 to be flown at the Air Force Flight Test Center arrived in January 1952, it was listed as #006. One test program was flown while the aircraft was at the Center. Almost 10 years later, another T-33 underwent a performance evaluation. Reports published of these tests, and others, are shown below:

TDR-52-34, dated August 1952, title:

Evaluation of Full Up Elevator of T-33 Aircraft to 20 Degrees

TDR-61-22, dated June 1961, title:

T-33A Performance Evaluation

TDR-64-29, dated October 1964, title:

Tests of the T-33 Aircraft Engaging the MA-1A Runway
Overrun Barrier

TR-69-39, dated September 1969, title:

Spin Evaluation of the T-33A with the Mid-Wing Pylons Installed

Test Authority: PD 69-85, dated 26 September 1969

Test Aircraft: T-33A s/n 56-1759

Test Period: 25-28 August 1969

Test Hours: 5.9

Test Missions: 4

A-37

The A-37 was designed for the Air Force to meet specific requirements for counterinsurgency operations, including close air support, armed escort for troop-carrying helicopters, combat air patrol for truck convoys, armed reconnaissance and night interdiction. It is a modified version of the T-37B trainer, but has approximately double the weight, and more than twice the power of the trainer.

Cessna Aircraft Company is the prime contractor, and the powerplant is two General Electric J85-GE-17A engines. The A and B series are the same size; span is 35 3/4 feet, length is 29 feet 2 inches, height is 9 feet 2 inches. Both series have approximately the same speed of 475 mph without external stores. Ceiling for the A series is approximately 25,000 feet, but is some 3,500 feet more for the B; range for the A is beyond 1,400 miles, while the B is capable of in-flight refueling. Both series may be flown with a crew of one or two.

Other differences between the A and B series; the B series has additional engine thrust, a 7.62mm minigun installed in the nose, flack curtains, and self-sealing fuel tanks. The B can carry about 700 pounds more of armament than the 4,855 pounds carried by the A series.

The experimental T-37, the XT-37, underwent performance and stability testing during the first half of 1955 at the Air Force Flight Test Center. Later, tests were flown with the T-37A and T-37B aircraft and, during 1968 and 1969, tests were conducted with the A and B series of the A-37. Reports published include the following:

TDR-28, dated August 1955, title:

Phase II Performance and Stability Tests on the
XT-37 Aircraft

TDR-56-29, dated January 1957, title:

T-37A Phase VI Functional Development

TDR-56-37, dated February 1957, title:

Phase IV Performance, Stability and Control Tests on the T-37

TDR-61-16, dated June 1961, title:

T-37B Category II Performance Test

TDR-61-59, dated December 1961, title:

T-37B Qualitative Spin Evaluation

TDR-63-7, dated April 1963, title:

T-37/J69 Engine Vibration Tests

TDR-64-14, dated July 1964, title:

YAT-37D Systems Evaluation

TDR-64-31, dated December 1964, title:

Category II Limited Performance Tests of the YAT-37D Aircraft

TR-68-13, dated December 1968, title:

Category II Stability and Control, A-37A

Test Authority: PD 67-42, dated 23 November 1966

Test Aircraft: A-37A s/n 67-14507

Test Period: 25 August 1967 - 1 February 1968

Test Hours: 36

Test Missions: not indicated

TR-68-23, dated February 1969, title:

Category II Performance Tests, A-37A

Test Authority: PD 67-42, dated 23 November 1966

Test Aircraft: A-37A s/n 67-14507

Test Period: 9 August 1967 - 9 February 1968

Test Hours: not indicated

Test Missions: not indicated

TR-69-12, dated May 1969, and SD-69-12, dated June 1969, title:

A-37B Category II Systems Test

Test Authority: PD 68-51, dated 19 February 1968

	Phase I	Phase II
Test Aircraft:	A-37A s/n 67-14507	67-14789 & 14777
Test Period:	1 Mar - 16 Jun 68	1 Oct 68 - 19 Mar 69
Test Hours:	50	103
Test Missions:	Approximately 134 for both phases	

TR-69-17, dated April 1969, title:

A-37B Qualitative Spin Test Program

Test Authority: PD 68-33, dated 21 December 1967

Test Aircraft: A-37B s/n 67-14789

Test Period: 27 November 1968 - 19 March 1969

Test Hours: 16.4

Test Missions: 16

TR-69-24, dated May 1969, and SD-69-24, dated July 1969, title:

A-37B Category II Performance and Stability and Control Tests

Test Authority: PD 68-33, dated 21 December 1967

Test Aircraft: A-37B s/n 67-14777

Test Period: 4 October 1968 - 28 April 1969

Test Hours: 101.6

Test Missions: 94

TR-69-24, Supplement, dated August 1968, title:

Evaluation of A-37B Handling Qualities with an Elevator
Servo Boost Tab and a Fixed Bobweight

Test Authority: ASD message No. 172024, 17 July 1969

Test Aircraft: A-37B s/n 67-14777

Test Period: 18 and 19 July 1969

Test Hours: 2

Test Missions: 2

T-39 Sabreliner

The T-39 is a member of the Sabre family of high-performance jets. A product of North American Aviation, Inc., the Sabreliner is powered by two Pratt & Whitney J60-P-3A turbojet engines with a thrust of 3,000 pounds each. It has capabilities as a passenger or cargo carrier, and as a trainer. Besides a crew of two, the T-39 can accommodate eight passengers.

Dimensions of the T-39 are; span 44 feet 5 inches; length 44 feet, and the height is 16 feet. It features 20-degree swept wings, aluminum alloy construction, tricycle landing gear, nose gear power-steering, speed brakes, and aerodynamically operated wing slats. It has a dual control cockpit. The T-39B is fitted with all-weather search-and-range-radar, and Doppler navigation systems for training F-105 pilots.

Speed of the Sabreliner is about 500 mph, ceiling is above 40,000 feet, and the range is beyond 950 miles with reserve.

First tested at the Air Force Flight Test Center during the latter part of 1958, the airplane was then known as the North American model N-246; the serial number was N4060K. Results of this test and subsequent tests with the Sabreliner were published in the following reports:

TDR-59-10, dated April 1959, title:
Model NA-246 (T-39) Air Force Flight Evaluation

TDR-62-2, dated June 1962, title:
T-39A Systems Evaluation

TDR-63-2, dated June 1963, title:
T-39A Follow-On Systems Evaluation

TDR-63-30, dated March 1963, title:
T-39A Limited Stability Test

TDR-64-23, dated October 1964, title:
T-39A Category II Performance Test

C-47, AC-47 and EC-47 Skytrain

The C-47 Skytrain, better known as the "Gooney Bird," was first flown in 1935. Since then it has seen service in World War II, the Berlin Airlift, Korea, and Southeast Asia. Manufactured by Douglas Aircraft Company, the Skytrain is powered with two Pratt & Whitney R1830-90 piston engines. It has a span of 95 feet, a length of 64 1/3 feet, and is 16 feet 10 inches high.

Speed of the C-47 is approximately 230 mph, ceiling is above 24,000 feet, and the range is beyond 2,000 miles. It requires a crew of three and can carry 27 passengers or 7,500 pounds of cargo. In Southeast Asia the Skytrain was used for such missions as airlift, paradrop, pinpoint drops to isolated outposts, night-flare drops, psychological warfare and cargo movement.

An attack version, the AC-47, is equipped with three side-firing 7.62mm miniguns, each capable of firing 6,000 rounds a minute. The AC-47 is often called the Dragon Ship, or "Puff the Magic Dragon" by U. S. forces in SEA.

Yet another version of the C-47 is the EC-47, and there are three series, N, P and Q; these are powered by the Pratt & Whitney R1830-92 engines rated at 1,200 brake horsepower. The C-47A was converted to the EC-47N, and the C-47D was converted to the EC-47P; 11 of the various C-47 models were converted to the EC-47Q. Externally the EC-47Q is identical to the EC-47N/P aircraft. The EC-47N/P aircraft was tested at the Air Force Flight Test Center in mid-1967, and the EC-47Q underwent testing in April and May of 1968. All testing was accomplished at the facilities

of Air International, Inc., Miami, Florida; the company which completed the modifications. Test reports published include the following:

TR-67-24, dated November 1967, title:

EC-47N/P Limited Performance Tests

Test Authority: PD 67-103, dated 24 April 1967

Test Aircraft: EC-47N/P s/n 43-16055

Test Period: 26 June - 24 July 1967

Test Hours: 44.1

Test Missions: 21

TR-68-22, dated November 1968, title:

EC-47Q Limited Performance Tests

Test Authority: PD 68-46, dated 31 January 1968

Test Aircraft: EC-47Q s/n 43-15204

Test Period: 6 April - 16 May 1968

Test Hours: 64.7

Test Missions: 31

B-52 Stratofortress

The Stratofortress was delivered to the U.S. Air Force in August 1954. Manufactured by The Boeing Company, various series of the B-52 are powered by different Pratt & Whitney engines; the J57-29WA turbojet engines are on the B through E series, the G series are powered with the J57-P-43 engines (turbojet), and the H series by the TF33-P-3 turbofan engines. Each B-52 has eight engines.

All B-52 aircraft have a span of 185 feet; the A through F series have a length of 156 feet, and the length of the G and H series is 157 feet; the A through F series are 48 feet high, and the G and H series are $40 \frac{2}{3}$ feet high. Speed is approximately 570 mph, ceiling is above 50,000 feet; the unrefueled range of the A through F is beyond 6,000 miles, it is beyond 7,500 miles for the G series, and beyond 9,000 miles for the H series.

Bomb load for the unmodified bomb bay is 54,000 pounds, and it is 64,000 pounds for the models modified for conventional bombing. Armament for the A through G series is four .50 caliber machineguns in the tail; and for the H series it is an ASG-21 Gatling gun in the tail. A crew of six is required for all B-52s.

Bomb bay and external modifications were required for the B-52 to carry conventional bombs to targets in Southeast Asia.

The first Stratofortress to be tested at the Air Force Flight Test Center was the XB-52, flown to Edwards AFB November 21, 1952. Technical reports published include the following:

TDR-53-2, dated June 1953, title:

Phase II Flight Tests of the XB-52 and the YB-52 USAF
s/n 49-23049-231

3.

TDR-55-23, dated June 1955, title:

XB-52 Longitudinal Dynamic Response

TDR-55-27, dated November 1955, title:

Phase IV Flight Test of the Boeing B-52A Airplane

TDR-55-27 Supplement I, dated February 1956, title:

B-52A Phase IV Performance and Stability Tests

TDR-55-52, dated December 1955, title:

B-52B Phase VI Functional Development

TDR-62-14, dated October 1962, title:

B-52H Weapon System Evaluation

TDR-62-14 Supplement I, dated October 1962, title:

B-52H Systems Evaluation Follow-On

TDR-63-16, dated November 1963, title:

B-52H Category II Performance and Stability Tests

Some of the above tests reported were conducted at the Boeing facilities and some were conducted at the Air Force Flight Test Center.

More recent tests include:

TR-67-30, dated February 1968, title:

Air Force Evaluation of the B-52 G and H Prototype Stability Augmentation and Flight Control System

Test Authority: PD 67-74, dated 27 January 1967

Test Aircraft: JB52H s/n 61-023

Test Period: 4-14 August 1967 at Wichita, Kansas

Test hours and test missions not available

TR-69-33, dated September 1969, and SD-69-33, dated October 1969, title:

Evaluation of the B-52G/H Production Stability Augmentation and Flight Control System

Test Authority: PD 67-47A, dated 17 July 1969

Test Aircraft: JB-52 s/n 61-023

Test Period: 29-31 July 1969 (at Boeing, Wichita, Kansas)

Test Hours: 14:05

Test Missions: 2

B-57 Canberra

The Martin Company B-57 was developed from the English Electric Company Canberra airplane. The first USAF model flew in July of 1953 and Tactical Air Command received its first B-57 eleven months later.

B-57s were used in Southeast Asia as tactical bombers performing missions of close support and interdiction. The RB-57 is designed and equipped to provide high-altitude reconnaissance in support of Air Weather Service requirements.

The B-57s are powered with two Wright J65-5 turbojet engines, and the RB-57s are powered with two TF-35-P-11A and two J60-P-9 turbojet engines. Other differences between the two aircraft are shown below:

	<u>B-57</u>	<u>RB-57</u>
Span	64 ft	122 ft, 5 in
Length	65 ft, 5 in	65 ft, 2 in
Height	16 ft	19 ft, 8 in
Speed	approx. 580 mph	approx. 475 mph
Ceiling	above 45,000 ft	above 60,000 ft
Range	beyond 2,000 miles	beyond 3,450 miles

The RB-57 carries no armament while the B-57 has eight wing-mounted .50 caliber machineguns, or four 20mm cannons plus eight 5-inch rockets or napalm bombs on wing pylons.

The English Electric Company B MK II aircraft was tested at the Air Force Flight Test Center before the Martin B-57 was tested, as the following reports indicate:

TDR-52-25, dated October 1952, title:

Phase II Stability and Control Evaluation of the English Electric Company B MK II Aircraft

TDR-54-20, dated September 1954, title:

Phase IV Flight Tests of the Stability and Control Characteristics of the Glenn L. Martin B-57A Aircraft USAF S/N 52-1419

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TDR-54-20 Addendum I, dated June 1955, title:
B-57A Phase IV Stability and Control Tests

TDR-54-23, dated October 1954, title:
Phase VI Tests of the RB-57A Aircraft

The following test report is classified, the title is not:

TR-65-4, dated July 1965, title:
RB-57F Category II Performance Test

EB-66 Destroyer

The B-66 aircraft became operational with the Air Force in March of 1956. Since then they have been converted to the EB-66 configuration, and some of the RB-66 aircraft, which became operational during the same period, have also been converted to the EB-66. The aircraft, manufactured by the Douglas Aircraft Company, is powered with two Allison J71-A-13 turbojet engines with a thrust of 10,200 pounds each.

The Destroyer has a span of 72 1/2 feet, it is 75 feet in length, and is 23 feet 7 inches high. Speed is approximately 600 mph, ceiling is above 45,000 feet, and the range is beyond 1,500 miles. A crew can be as small as three or as large as seven. The RB-66, with an in-flight probe and drogue, has a greater range than the B-66.

Only one test is recorded for the B-66 at the Air Force Flight Test Center, however there were several tests of the RB-66. No tests are on record for the EB-66 aircraft. Reports of tests conducted include:

TDR-55-5, dated April 1955, and Addendum I, dated October 1955, title:
RB-66A Phase II Performance, Stability and Control Tests

TDR-55-45, dated February 1956, and Addendum I, dated May 1956, title:
RB-66B Phase VI Functional Development

TDR-56-6, dated May 1956, title:
RB-66B Phase IV Performance Tests

TDR-57-19, dated September 1957, title:
RB-66B Phase IV Limited Performance and Stability Tests

TDR-57-23, dated January 1958, title:
RB-66C Limited Phase IV Stability and Performance Tests

TDR-57-36, dated February 1958, title:
B-66B Labs Stability Tests

TDR-58-17, dated May 1958, title:
RB-66B Limited Performance Tests with the J71-A-13 Engines

SR-71

Primary function of the SR-71 aircraft is advanced strategic reconnaissance. The Lockheed Aircraft Corporation is the prime contractor, and the aircraft is powered by two Pratt & Whitney J58 turbojet engines with afterburners. Its speed is in excess of 2,000 mph, and the ceiling is above 80,000 feet. The crew is comprised of two, a pilot and a reconnaissance systems officer.

The development of the SR-71 began in February 1963, and the first flight was made December 22, 1964. The aircraft became operational when it was assigned to the 9th Strategic Reconnaissance Wing (Strategic Air Command) at Beale AFB, California, January 7, 1966.

Although testing of the SR-71 and its prototype, the YF-12A, was conducted at the Air Force Flight Test Center, with center resources and Strategic Air Command and Center manpower, the test results are highly classified and not available.

F-100 Supersabre

This fighter-bomber became an integral part of the Tactical Air Command late in 1954; it was the first USAF aircraft to fly at supersonic speed in level flight. Using in-flight refueling, the D and E series have almost unlimited range; these are equipped with autopilots and have a speed of more than 800 mph.

Built by North American Aviation, Inc., the F-100 is powered by a Pratt & Whitney J57-P-21A/F-21A turbojet engine with afterburner. The aircraft has a span of 38 feet, is 49 feet in length, and 16 feet high; speed is more than 800 mph (D and E series), ceiling is above 50,000 feet, and the range is beyond 1,600 miles.

Armament for the F series is two 20mm cannons, Sidewinder and Bullpup missiles; the D is armed with four 20mm cannons. The F series uses a crew of two, other series use a crew of one.

Testing of the F-100 began at the Air Force Flight Test Center with the prototype YF-100 and, through the years, has included A, C, D and F series. Test reports published include the following:

TDR-53-33, dated December 1953, title:
Phase II Performance and Stability Tests of the YF-100 Airplane

TDR-54-26, dated December 1954, title:
F-100A Phase IV Performance Tests

TDR-55-3, dated January 1955, and Addendum I, dated May 1955, title:
F-100A Phase IV Functional Development

TDR-55-9, dated June 1955, and Addendum I, dated December 1955, title:
F-100A Phase IV Stability and Control Tests

TDR-55-34, dated November 1955, title:
F-100C Phase II Flight Evaluation

TDR-56-25, and Addendum I, dated November 1956, title:
F-100C Phase IV Stability and Control

TDR-57-2, dated March 1957, title:
F-100D Phase VI Functional Development Test

TDR-58-3, dated March 1958, title:
F-100F Limited Phase IV Performance and Qualitative
Stability and Control

TDR-58-27, dated September 1958, title:
F-100D Performance and Stability and Control

TDR-58-41, dated February 1959, title:
F-100D Zero Length Launch

TDR-59-15, dated May 1959, title:
F-100F Limited Category II Performance Tests

TDR-60-60, dated December 1960, title:
Evaluation of the Bent Refueling Boom and Universal Aerial
Systems for the F-100 and F-101 Aircraft

TDR-60-69, dated December 1960, title:
Universal Aerial Refueling Production System Suitability
Test of F-100 Aircraft

TDR-61-60, dated January 1962, title:
Flight Evaluation of the F-100 Type III 335-Gallon External
Fuel Tank

TDR-61-63, dated April 1962, title:
F-100 Performance with Two 335-Gallon Drop Tanks

TDR-61-64, dated April 1962, title:
F-100 Performance with Two Type X Launchers and Two GAM Missiles

RF-101 Voodoo

The RF-101 was the first supersonic photo reconnaissance aircraft for the USAF, becoming operational with Tactical Air Command in May of 1957. Built by McDonnell Aircraft Corporation, the Voodoo is powered by two Pratt & Whitney J57-P-13 turbojet engines with a thrust of 15,000 pounds each. The RF-101 has a speed of approximately 1,000 mph, ceiling is above 50,000 feet, and the range is beyond 1,800 miles. The aircraft can be refueled in flight by using either the flying boom or the probe and drogue technique.

The Voodoo has a span of 39 feet 9 1/2 inches, the length is 69 feet, and it is 18 feet high. A crew of one is required. Special equipment includes one low altitude panoramic camera, three high-speed framing cameras, and two focal length altitude cameras; black and white or color film may be used. The Voodoo was used in Southeast Asia for aerial reconnaissance and strike evaluation missions.

No actual testing of the RF-101 was conducted at the Air Force Flight Test Center. The F-101 underwent several tests between 1955 and 1960, and an experimental XF-88, from which the F-101 was adapted, was tested during the first half of 1950. The XF-88 tests were completed July 10, 1950, and included 26 flight test missions and a total of 16 hours 15 minutes of flight test time. These tests were performed prior to the activation of the Air Force Flight Test Center.

The following reports have been published for F-101 tests:

TDR-55-32, dated September 1955, title:
F-101 Phase II Flight Evaluation

TDR-56-14, dated July 1956, and Addendum I, dated August 1956, title:
F-101 Phase IV Stability and External Stores

TDR-56-16, dated August 1956, title:
F-101A Phase VI Functional Analysis

TDR-56-16 Addendum I, dated March 1958, title:
F-101A Phase VI 2nd Increment

TDR-56-28, dated December 1956, title:
F-101A Phase IV Performance Tests

TDR-56-28 Addendum I, dated September 1958, title:
F-101A Limited Performance Tests

TDR-58-11, dated May 1958, title:
F-101B Phase II Stability and Control Flight Evaluation

TDR-58-30, dated October 1958, title:
F-101B Category I Performance Tests

TDR-59-22, dated September 1959, title:
F-101B Category II Stability and Control Tests

TDR-60-6, dated April 1960, title:
F-101B Category II Performance Test

TDR-60-60, dated December 1960, title:
Evaluation of the Bent Refueling Boom and Universal Aerial
Systems for the F-100 and F-101 Aircraft

F-102 Delta Dagger

First flown in 1953, this fighter-interceptor became operational in mid-1956. The F-102 was developed from the experimental XF-92 which arrived for testing at the Air Force Flight Test Center May 18, 1951, a month before the activation of the Air Force Flight Test Center.

Produced by the Convair Division of General Dynamics, the F-102 is powered by a Pratt & Whitney J57-P-23A jet engine with a thrust of 10,200 pounds. The Delta Dagger has a span of 38 feet 1 inch, is 68 feet 7 inches in length, and 21 1/2 feet high. The speed is approximately 800 mph, ceiling is above 50,000 feet, and the range is beyond 1,000 miles. A crew of one is required.

Falcom missiles and the 2.75-inch Mighty Mouse rockets make up the armament for the F-102's role as an all-weather jet interceptor. Test reports published include the following:

TDR-53-11, dated April 1953, title:
Performance Flight of the XF-92 Airplane

TDR-56-23, dated January 1957, title:
F-102 Phase IV Performance Tests

TDR-56-23 Addendum I, dated July 1957, title:
F-102 Phase IV Performance with Two Standard Class II
230-Gallon Pylon Tanks

TDR-56-34, dated March 1957, title:
Phase VI F-102A Functional Development

TDR-57-5, dated April 1957, title:
F-102A Phase IV Stability Tests

TDR-57-25, November 1957, title:
F-102A Case XX Wing Phase IV Performance

TDR-60-42, dated November 1960, title:
Runway Barrier of the F-102 Arresting Hook

F-104 Starfighter

Designed as a supersonic air superiority fighter, the Starfighter has two roles; as a tactical fighter for Tactical Air Command, and as a day-night interceptor for Aerospace Defense Command. The F-104 has other roles too; equipped with wing-tip jet pods it was used to train X-15 pilots; it has been modified as a drone, a trainer, a reconnaissance aircraft, an astronaut proficiency trainer, and for zero-launch experiments.

Built by Lockheed Aircraft Corporation, the Starfighter is equipped with a General Electric J79 turbojet engine with afterburner. The span of the F-104 is 21 feet 11 inches, the length is 24 3/4 feet, and it is 13 1/2 feet high. Speed is approximately 1,400 mph, ceiling is above 50,000 feet, and the range is beyond 1,450 miles. Series A, C and G require a crew of one; the B and D series use a crew of two. Armament consists of Sidewinder missiles and M-61 20mm cannons.

An experimental F-104, the XF-104, first flew at the Air Force Flight Test Center March 5, 1954. Since that first period of testing there have been many more, as shown by the following reports:

TDR-55-8, dated May 1955, title:
XF-104 Phase II Performance, Stability and Control Tests

TDR-56-31, dated December 1956, title:
F-104 Phase II Flight Evaluation

TDR-57-20, dated October 1957, title:
YF-104B Phase II Flight Evaluation

TDR-58-9, dated April 1958, title:
F-104C Phase VI Functional Development

TDR-58-12, dated April 1958, title:
Phase II Evaluation of the F-104B with an Enlarged Vertical Stabilizer

TDR-58-14, dated May 1958, title:
F-104 Phase IV Stability and Control

TDR-58-14 Addendum I, dated July 1959, title:
F-104 Stability and Control

TDR-58-21, dated May 1958, title:
F-104 Performance

TDR-58-32, dated October 1958, title:
F-104B Category II Performance and Stability Evaluation

TDR-58-40, dated February 1959, title:
F-104 Performance with TX-28 Store and External Tanks

TDR-59-1, February 1959, title:
F-104C Category II Systems Evaluation and Limited
Operational Stability Tests

TDR-61-62, dated January 1962, title:
F-104D High Density Fuel Range Test

TR-65-9, dated July 1965, title:
Comparative Evaluation of the Effect of Aft Body Strakes on the
Structure, Stability and Performance of the F-104A Airplane
Test Authority: PD 64-67, dated 30 March 1964
Test Aircraft: F-104A s/n 56-0752
Test Period: 4 August - 4 November 1964
Test Hours: 48:10
Test Missions: 56

TR-68-25, dated January 1969, title:
Evaluation of the Performance of an F-104A Aircraft with a
J79-GE-19 Engine
Test Authority: PD 67-108, dated 31 May 1967
Test Aircraft: F-104A s/n 56-0833
Test Period: 3 August 1967 - 4 January 1968
Test Hours: 39.5
Test Missions: 45

F-105 Thunderchief

The F-105 is an all-weather fighter-bomber, capable of a speed of Mach 2. Its characteristics, performance, and firepower qualify it for use in counter-air, close support or interdiction roles in either limited or general war.

Built by Republic Aviation Company, the Thunderchief is powered by a Pratt & Whitney J75-P-19W turbojet engine with water injection. It has a span of 34 feet 11 inches, is 64 1/4 feet in length, and 19 2/3 feet high. Speed of the F-105 is about 1,400 mph, the ceiling is above 48,000 feet, and the range is beyond 1,500 miles.

Armament of the F-105 varies, internally and externally; various combinations of nuclear and conventional devices, clusters of rockets or guided or unguided missiles can be carried. The D series is flown by a crew of one, and the F series by a crew of two.

The prototype of the F-105, the YF-105, made its first test flight at the Air Force Flight Test Center October 22, 1955. Center conducted tests began March 16, 1956 with the YF-105 s/n 54-099; the results of this test was published in the following classified report:

TDR-56-18, dated July 1965, title:
YF-105A Phase II Flight Evaluation

The following reports were published on subsequent tests:

TDR-57-9, dated June 1957, title:
Phase II Flight Evaluation of the F-105B Airplane

TDR-58-37, dated December 1958, title:
F-105B Performance Test with J76-P-3 Engine

TDR-59-2, dated April 1959, title:
F-105B Performance Test with J75-P-5 Engine

TDR-59-29, dated November 1959, title:
F-105B Category II Stability and Control

TDR-59-39, dated February 1960, title:

F-105B Performance Test with J75-P-19 Engine

TDR-61-47, dated March 1962, title:

F-105D Category II Performance and Stability Tests

TDR-64-33, dated January 1965, title:

F-105F Limited Category II Performance, Stability
and Control Tests

F-111

This multi-purpose fighter features a variable-sweep wing which can be positioned in flight at various angles between the full forward and aft positions. First flown December 21, 1964, the F-111 has undergone extensive testing at the Air Force Flight Test Center. The first operational F-111 was delivered to Tactical Air Command October 16, 1967; it made its initial appearance in Southeast Asia March 17, 1968.

A product of General Dynamics Corporation, the F-111 is powered by two Pratt & Whitney TF30-P-3 turbofan engines with a rated thrust of 20,000 pounds each. With the wings retarded the span is 31 feet 11 inches, fully extended the span is 63 feet; length is 73 1/2 feet, and the height is 17 feet.

The F-111 has a transoceanic range, ceiling is above 60,000 feet, and it has a speed of Mach 2.5. Conventional and nuclear weapons, including air-to-surface tactical missiles and rockets, give a wide choice for armament. It is flown by a crew of two.

The following reports were published on results of tests conducted by the Air Force Flight Test Center:

Progress Report, January-July 1967 (first five months), title:

Category II Stability and Control Tests

Test Aircraft: F-111A s/n 63-9782

Test Period: January-June 1967

Test Hours: not indicated

Test Missions: 8

TR-68-16, dated September 1968, title:

F-111A Category II Refused Takeoff Tests

Test Authority: PD 67-112, dated 30 June 1967

Test Aircraft: F-111A s/n 63-9766

Test Period: 1 November 1967 - 18 March 1968

Number of tests: 33 (13 high-speed taxi, 20 refused takeoff)

TR-69-9, dated June 1969, title:

Category II F-111A/Arresting System Compatibility Tests

Test Authority: PD 62-69C, dated 15 July 1964

Test Aircraft: F-111A s/n 63-9766

Test Period: 2 February - 8 August 1968

Number of tests: 59

TR-69-10, dated May 1969 and SD-69-10, dated July 1969, title:

F-111A Category II Stability and Control Tests

Test Authority: PD 62-69D, dated 12 January 1965

Test Aircraft: F-111A s/n 63-9782

Test Period: 9 January 1967 - 15 April 1968

Test Hours: 143

Test Missions: 74

SD-69-38, dated November 1969, title:

F-111A Category II Performance Tests

Test Authority: PD 62-69C, dated 15 July 1964

Test Aircraft: F-111A s/n 65-5704

Test Period: 21 December 1967 - 8 September 1969

Test Hours: 154

Test Missions: 49

TR-69-46, dated January 1970, title:

Category II F-111A Reliability and Maintainability Evaluation

Test Authority: PD 62-69C, dated 15 July 1964

Test Aircraft: various

Test Period: 1 January 1968 - 31 October 1969

Test Hours: 1,140

Test Missions: 646

The following reports of tests accomplished are classified; the report number and title are not classified:

TR-66-37, dated January 1967, title:

F-111A Initial Category II Landing Performance Evaluation

TR-67-7, dated June 1967, title:

Air Force Preliminary Evaluation of the F-111A with External Stores

TR-67-21, dated January 1968, title:

Air Force Preliminary Evaluation of the F-111A Weapon System

SD-69-10, dated July 1969, title:

F-111A Category II Stability and Control Tests, Buffet Onset

TR-69-27, dated July 1969, title:

F-111A Production Airplane Performance Evaluation

TR-69-38, dated October 1969, title:
F-111A Category II Performance Tests

TR-69-44, dated December 1969, title:
Air Force Preliminary Evaluation of the F-111D Avionics
System (First Evaluation)

TR-69-45, dated December 1969, title:
Category II Tests of the F-111A Penetration Aids Subsystem

TR-69-47, dated February 1970, title:
F-111A Category II Propulsion Subsystem Test

TR-69-48, dated March 1970, title:
Category II F-111A Firepower Control Subsystem Evaluation

TR-70-2, dated February 1970, title:
Category II F-111A Armament Subsystem Evaluation

Letter Reports:

F-111A Preliminary Performance Evaluation, September 1967

F-111A Static Thrust Runs, November 1967

F-111A Preliminary Performance Evaluation with 4 MK84s,
December 1967

F-111A Preliminary Performance Evaluation with M-117 and
M-118 Bombs, January 1968

C-118 Liftmaster

Built by Douglas Aircraft Company, the C-118 is a military version of the commercial DC-6A. It is powered by four Pratt & Whitney R2800-52W piston engines. It has a speed of 370 mph, ceiling is above 20,000 feet, and the range is beyond 5,000 miles. The Liftmaster has a span of 117 feet 7 inches, is 106 feet 10 inches in length, and 28 2/3 feet high. It requires a crew of five.

Th C-118 has been used in the Pacific and in Europe for aeromedical evacuation to deliver patients from combat areas and from theater points to central pickup points. It has a capacity for 61 litter patients or 79 fully equipped troops, or it can carry 25,500 pounds of cargo.

There is no record of tests being conducted at the Air Force Flight Test Center with the C-118 airplane.

C-119 Packet

Better known as the "Flying Boxcar" or the "Dollar Nineteen" by its crew members and their associates, the C-119 first flew in 1947. It was used effectively during the Korean War for air drops and troop movements. Until a couple of years ago the C-119 was flown almost exclusively by Air Force Reserve units, or resting in storage at Davis-Monthan AFB, Arizona.

Built by Fairchild, the C-119 has a span of 190 1/3 feet, is 86 1/2 feet in length, and 26 feet 2 inches high. The AC-119G and AC-119K, are powered with two General Electric J85-17 jet engines pod-mounted plus two Wright R3350-85 or two Pratt & Whitney 4360-20W piston engines. A crew of from three to five is required.

The G and K series have four miniguns and sensor/illumination equipment; the K series also has two 20mm rapid-fire Vulcan cannons. Most recent testing at the Air Force Flight Test Center was with the G and K series, the gunship configuration. Early day testing was accomplished with the F, G and H series. Test results were published in the following reports:

TDR-52-39, dated April 1953, title:
Phase II Flight Tests of the C-119H Airplane

TDR-53-29, dated December 1953, title:
Partial Phase IV Flight Test of the C-119F
Aircraft USAF s/n 51-8098

TDR-54-7, dated March 1954, title:
Partial Phase IV Flight Tests on the C-119G
Aircraft USAF s/n 51-8053

TDR-54-7 Addendum I, dated March 1956, title:
Heavy Weight Tests of the C-119G

TR-69-4, dated March 1969 and SD-69-4, dated May 1969, title:
AC-119G Aircraft Limited Performance and Stability and Control Tests
Test Authority: PD 69-21, dated 6 September 1968
Test Aircraft: AC-119G s/n 53-3145
Test Period: 19 October 1968 - 23 January 1969
Test Hours: 54.1
Test Missions: 30

TR-70-4, dated March 1970, title:
AC-119K Limited Performance and Flying Qualities Tests
Test Authority: PD 68-69, dated 27 August 1968
Test Aircraft: AC-119K s/n 53-3187
Test Period: 18 August 1969 - 26 February 1970
Test Hours: 88.1
Test Missions: 53

EC-121 Constellation

The EC-121 is a radar-picket modification of the commercial and troopcarrier versions of the Super Constellation. Built by Lockheed Aircraft Corporation, the EC-121 is powered by four Wright R3350-93 piston engines of 3,500 horsepower each. The EC-121, developed from the Navy's RC-121, carries six tons of electronic equipment including, search radar, cloud-collision equipment in the nose, a bearing antenna in the vertical radome, and height finding antenna in an eight-foot-high dorsal structure. Increased range is obtained by addition of wing-tip fuel tanks. A new electronic system, the Airborne Long Range Input (ALRI), has been added to the EC-121.

Dimensions of the EC-121 are; span, 123 feet; length 116 feet 1 7/8 inches; height 24 feet 10 3/4 inches. Speed is 300 mph, ceiling is above 25,000 feet, and the range is beyond 6,500 miles. A crew may be comprised of up to 18 members.

Air Force Flight Test Center records fail to indicate any testing of the EC-121 airplane, however a prototype, YC-121, underwent two test programs as shown by the following reports:

TDR-56-9, dated June 1956, title:
YC-121 Limited Phase II Performance Test

TDR-56-10, dated May 1956, title:
YC-121 Safety of Flight Evaluation

C-123 Provider

Built by Fairchild, the Tactical Air Command first received the C-123 in July of 1955. The primary function of the Provider was for intratheater (tactical) airlift, however it is an all-purpose aircraft that can operate from short unimproved runways. The C-123 is powered by two Pratt & Whitney R2800-99W engines of 2,500 horsepower each, and the K series has two auxiliary jet engines, General Electric J85-GE-17, with 2,850 pounds of thrust each. The auxiliary engines provide the C-123K with a shorter takeoff and a faster rate of climb.

Dimensions of the Provider are; span, 110 feet; length 76 1/4 feet, height 34 feet 1 inch. All C-123s have a ceiling above 20,000 feet; the B series has a speed of 180 mph, and the K series, 230 mph. Range of the B is 1,900 miles, and for the K it is 1,500 miles. The majority of the K series were in Vietnam and the remainder were assigned to Tactical Air Command.

The first test of the C-123 at the Air Force Flight Test Center was completed November 24, 1953. The results of the test were published in Technical Documentary Report 54-6 dated December 1954, and Addendum I, dated September 1954, titled, "Phase II Tests of the C-123B Aircraft USAF s/n 52-1627." Then, in March 1955, two auxiliary jet engines were installed on the wing tips of the same aircraft and Addendum II to TDR 54-6, titled "Evaluation of the YC-123B Airplane USAF s/n 52-1627 with Two Wing-Tip Jet Engines Installed" was published during April of 1955.

Other tests included:

TDR-55-12, dated May 1955, title:

C-123 Phase IV Performance Tests

TDR-55-40, dated October 1955, title:

C-123 Phase VI Functional Development

TDR-58-31, dated October 1958, title:

C-123J Performance Test

TDR-63-8, dated April 1963, title:

Project Rough Road Alpha Takeoff and Landing Capabilities of
C-130, JC-130B, NC-130B (BLC), C-123B and YC-123H Aircraft

TD-67-11, dated August 1967, title:

C-123K Limited Performance and Stability and Control Tests

Test Authority: PD 66-104, dated 11 January 1966

Test Aircraft: C-123K s/n 54-581

Test Period: 3 October 1966 - 26 January 1967

Test Hours: 37 plus 2.5 hours 1 June 1967

Test Missions: 37 plus 2 flights 1 June 1967

(Testing was accomplished at Fairchild-Hiller facility,
Hagerstown, Maryland, and at Olmstead AFB, Pennsylvania.)

C-124 Globemaster

Although the last production Globemaster was delivered to the Air Force in 1955, the aircraft continues to serve for vital airlift requirements. Built by Douglas Aircraft Company, the C-124 is powered by four Pratt & Whitney R4360-63A piston engines.

The Globemaster has a span of 174 feet 2 inches, length is 130 feet, and it is 48 1/4 feet high. It has a speed of 300 mph, ceiling is above 20,000 feet, and it has a range of 2,300 miles with 50,000 pounds of cargo. Its load capacity is 74,000 pounds of cargo, or 200 fully equipped troops, or 127 litter patients plus 31 attendants or ambulatory patients.

Clamshell doors and a built-in ramp permit rapid loading and unloading of heavy cargo. Almost every motorized vehicle used by the military can be driven up the front loading ramp of the Globemaster.

Testing of the C-124 was carried on at the Air Force Flight Test Center during the period of 1952-1955. The following reports were published:

TDR-52-40, dated January 1953, title:
Phase IV Performance of the Douglas C-124A Airplane

TDR-53-28
C-124 Limited Phase IV Performance, Stability and Control Tests

TDR-55-22, dated July 1955, title:
Phase II Performance of the YC-124B Aircraft

C-130 Hercules

The primary mission of the C-130 airplane is to provide tactical airlift. In Southeast Asia it was used for aerial delivery of supplies, as a troop carrier, as a drone director, for search and rescue, and as an attack aircraft.

Built by the Lockheed Aircraft Corporation, the Hercules series B and E are powered by four Allison T56-A-7 turboprop engines of 4,050 equivalent-shaft horsepower each. The C-130 has a span of 132 feet 7 inches, length of 97 3/4 feet, and is 38 1/3 feet high. The speed is around 300 mph, ceiling is above 30,000 feet, and the range is beyond 2,000 miles. The aircraft is manned by a crew of four, five when a loadmaster is required.

As an attack aircraft, the AC-130 has four 7.62mm miniguns, four 20mm rapid-fire cannons, and sensor/illumination equipment. The operational tests for this modification were completed in Southeast Asia.

The prototype and several series of the C-130 underwent testing at the Air Force Flight Test Center; following is a list of reports published:

TDR-55-37, dated June 1964, title:

YC-130 Phase II Flight Evaluation

TDR-57-17, dated September 1957, title:

C-130 Phase VI Functional Development Test

TDR-57-32, and Addendum I dated February 1958, title:

Phase IV Performance, Stability and Control Tests of the C-130A

TDR-58-39, dated January 1959, title:

C-130A Ski-Wheel Performance Tests

TDR-59-17, dated June 1959, title:

C-130B Category I Stability and Control

TDR-59-36, dated December 1959, title:
C-130B Systems Evaluation

TDR-60-10 dated May 1960, and Addendum I, dated June 1960, title:
C-130B Category II Performance Tests

TDR-61-4, dated February 1961, title:
C-130BL Category I Performance Test and Qualitative
Stability and Control Evaluation

TDR-62-25 and Supplement I, dated August 1962, title:
Phase I Project Rough Road - An Evaluation of the C-130B Short
Field Takeoff and Landing Capabilities on Unprepared Surfaces

TDR-63-8, dated April 1963, title:
Project Rough Road Alpha Takeoff and Landing Capabilities of
C-130B, JC-130B, NC-130B(BLC), C-123B and YC-123H from Off
Runway (Unprepared) Surfaces

TDR-63-37, dated July 1964, title:
C-130E Combined Category I and II Performance Tests

TDR-63-45, dated February 1964, title:
C-130 Aircraft Ramp Unloading Kit

TDR-64-2, dated June 1964, title:
Limited C-130E Category II Stability and Control Tests

TDR-64-35, dated January 1965, title:
C-130E Performance at Emergency-War-Time-Use Only Gross Weight

TR-65-23, dated August 1966, title:
Evaluation of the Monitair Angle of Attack/Stall Warning
System Installed in a C-130E Aircraft
Test Authority: PD 65-64, dated 16 April 1965
Test Aircraft: C-130E s/n 62-1854
Test Period: 19-20 August 1965
Test Hours: 12:30
Test Missions: 5

TR-66-23, dated February 1967, title:
HC-130H Category II Performance and Limited Stability
and Control Tests
Test Authority: PD 64-65, dated 4 February 1964
Test Aircraft: HC-130H s/n 64-14852
Test Period: 8 December 1965 - 20 June 1966
Test Hours: 130:25
Test Missions: 46

TR-66-43, dated March 1967, title:

Evaluation of the C-130E Stability and Control Characteristics
and the A/A32H-4 Dual Rail Cargo Handling System During Low
Level Cargo Deliveries

Test Authority: PD 66-1, dated 21 July 1965

Test Aircraft: C-130E s/n 64-0560

Test Period: 28 February - 15 July 1966

Test Hours: not available

Test Missions: 75

TR-66-47, dated February 1968, title:

HC-130H Category II/III Systems Evaluation

Test Authority: PD 64-55, dated 4 February 1964

Test Aircraft: HC-130H s/n 64-14855, 14856, and 14859

Test Period: 28 February 1965 - 31 December 1966

Test Hours: 2,334:20

Test Missions: 691

TR-67-18, dated November 1967, title:

Evaluation of the C-130E Stability and Control Characteristics
During Tandem, Sequential and Single-Platform LAPES Deliveries
and Airdrop Deliveries

Test Authority: PD 67-17, dated 19 July 1966

Test Aircraft: C-130E s/n 64-0560

Test Period: 3 August 1966 - 16 May 1967

Test Hours: not available

Test Missions: 93

TR-68-32, dated February 1969, title:

Air Minimum Directional Control Speed and Limited Performance
Evaluation of a C-130A Aircraft Equipped with Hamilton
Standard Four-Blade Propellers

Test Authority: PD 68-21A, dated 11 June 1968

Test Aircraft: C-130A s/n 56-0521

Test Period: 11 June - 8 November 1968

Test Hours: 48

Test Missions: 19

KC-135 Stratotanker

This aerial tanker and transport aircraft is a product of The Boeing Company, and is powered by four Pratt & Whitney J57-P-57W turbo jet engines, each with a thrust of 13,750 pounds (KC-135A). The KC-135 has a span of 130 feet 10 inches, is 136 1/4 feet in length, and 41 2/3 feet high. Speed is around 600 mph, ceiling is above 50,000 feet, and the range is beyond 5,000 miles. A crew of four is required.

The KC-135 role in Southeast Asia was diversified. It was used to refuel combat fighters as well as aircraft participating in rescue operations, high priority transport, and aircraft being deployed from the United States.

Since the late 1950s many tests have been conducted with the Stratotanker by the Air Force Flight Test Center; reports published include the following:

TDR-57-11, dated July 1957, title:

Phase II Flight Evaluation of the KC-135 Airplane

TDR-58-1, dated February 1958, title:

KC-135A Stability and Control Tests

TDR-58-13, dated June 1958, title:

KC-135A Stability and Control Tests

TDR-58-26, and Addendum I, dated October 1958, title:

KC-135A Heavyweight Performance Test

TDR-58-26 Addendum II, dated October 1959, title:

KC-135A Performance Test with Leading Edge Flaps

TDR-63-18, dated December 1963, title:

ICC-KC-135A Heavy Weight Three Engine Takeoff Performance Test

TDR-64-6, dated July 1964, title:

C-135 Limited Category II Stability and Control Tests

TDR-64-41, dated April 1965, title:

KC-135 Limited Category II Performance Tests

TDR-64-43, dated March 1965, title:

Brake Performance Evaluation of a KC-135A Equipped with
4-Rotor Brakes and a Modified Antiskid Braking System

TR-66-15, dated July 1966, title:

KC-135 Hydraulic System Capability Degradation Tests

Test Authority: PD 65-70A, dated 26 May 1965

Test Aircraft: KC-135A s/n 60-366

Test Period: not available

Test Hours: not available

Test Missions: not available

(Testing was accomplished at Eglin AFB, Fla., and Edwards AFB, Calif.)

TR-66-31, dated December 1966, title:

KC-135A Low Speed Controllability Tests

Test Authority: PD 65-70, dated 10 May 1965

Test Aircraft: KC-135A s/n 60-366

Test Period: 13 September 1965 - 14 March 1966

Test Hours: 178.75

Test Missions: 83

TR-69-36, dated September 1969, title:

Systems Evaluation of the C/KC-135 Integrated Dual Flight
Director/Rotation Go-Around System

Test Authority: PD 69-75, dated 14 May 1969

Test Aircraft: KC-135 s/n 59-1511

Test Period: 17 June - 22 August 1969

Test Hours: 75.6

Test Missions: 32

TR-69-37, dated September 1969, title:

C/KC-135 Takeoff Performance Evaluation Using the Integrated
Dual Flight Director/Rotation Go-Around System

Test Authority: PD 69-75, dated 14 May 1969

Test Aircraft: KC-135A s/n 59-1511

Test Period: 19 June - 22 August 1969

Test Hours: 75.6

Test Missions: 32

(The above two tests were accomplished at the same time)

C-141 Starlifter

The C-141 is the newest operational cargo-troop carrier transport in the USAF inventory (not counting the C-5 Galaxy now undergoing tests). It can be flown from California to South Vietnam in 19 hours. It has a capacity for 154 fully equipped troops; 80 litter patients; 70,000 pounds of cargo for 4,000 miles or 31,000 pounds for 6,300 miles.

Built by Lockheed Aircraft Corporation, the Starlifter is powered by four Pratt & Whitney TF33-P-7 turbofan engines with a rated thrust of 21,000 pounds each. It has a span of 160 feet, is 145 feet in length, and 39 1/4 feet high. Cruise speed is around 500 mph, ceiling is above 41,000 feet, and the range varies according to the load; from beyond 6,300 miles with 32,000 pounds, to more than 4,600 miles with 62,500 pounds of cargo.

Tests with the C-141 aircraft at the Air Force Flight Test Center began during the mid-1960s; Technical Reports on tests concluded are listed below:

TR-65-38, dated July 1966, title:

C-141A Category II Systems Evaluation

Test Authority: PD 63-41, dated 19 December 1962

Test Aircraft: C-141A s/n 63-8075

Test Period: 15 June 1964 - 15 May 1965

Test Hours: 2,501

Test Missions: 442

TR-66-5, dated June 1966, title:

C-141A Category II Stability and Control Tests

Test Authority: PD 64-16, dated 18 September 1963

Test Aircraft: C-141A s/n 63-2775, 2776 and 2777

Test Period: 27 October 1964 - 14 September 1965

Test Hours: 135:30

Test Missions: 36

TD-66-9, dated August 1966, title:

C-141A Category II Performance Tests

Test Authority: PD 64-16, dated 18 September 1963

Test Aircraft: C-141A s/n 61-2775 and 61-2776

Test Period: 19 October 1964 - 29 September 1965

Test Hours: 257

Test Missions: 75

TR-67-3, dated June 1967, title:

C-141A Category II Lightweight Stability and Control Tests

Test Authority: PD 64-16, dated 18 September 1963

Test Aircraft: C-141A s/n 61-2776

Test Period: 7 September - 5 October 1966

Test Hours: 56:55

Test Missions: 27

UH-1 Iroquois

Various series of this helicopter were built by Bell Helicopter Company for use by the U.S. Army, including the AH-1 Hueycobra. The Air Force has concentrated on the UH-1F powered with a General Electric T58-GE-8B shaft turbine engine. The Army UH-1, series A, B, C, D, H, and the Cobra (series G) are powered by a Lycoming T53-L engine.

The UH-1 is a low silhouette and low vulnerability to meet combat requirements. It is of all metal construction and has a closed cabin, and may be equipped with various weapons for use in a suppressive fire role. The dimensions of the different series vary; for example, the UH-1B fuselage is 42 feet 7 inches in length, and 13 feet 2 inches high, while the Air Force UH-1F is 14 1/3 feet high and the length of the fuselage is 44 feet 7 inches.

The HU-1, an early designation for this helicopter, and the prototype, a YHU-1, underwent tests at the Air Force Flight Test Center during the early 1960s. The following reports were published on the prototype and the HU-1 helicopters:

TDR-60-57, dated February 1961, title:
HU-1 Stability and Control Evaluation

TDR-61-39, dated August 1961, title:
YHU-1B Performance, Stability and Control

TDR-62-13, dated August 1962, title:
YHU-1B Stability and Control Tests

TDR-62-21, dated December 1962, title:
YHU-1 Category II Performance Tests

TDR-62-29, dated December 1962, title:

Flight Evaluation of the H-21C, HU-1A and H-34C Equipped with the XM-153 Armament Kits

TDR-62-30, dated May 1963, title:

Flight Test Evaluation of the HU-1 Helicopter Equipped with the 2.75 Aircraft Interim Area Rocket Weapon System

TDR-62-35, dated June 1963, title:

Flight Evaluation of the HU-1/SS-11/AN/ASW-12(V) Weapons System

TDR-62-35 Supplement I, dated July 1963, title:

Flight Evaluation of an HU-1 Equipped with the XM-153 Armament Kit

TDR-62-42, dated March 1964, title:

HU-1D Category I Performance, Stability and Control Tests

For the following tests the designation for the helicopter was changed from the HU-1 to UH-1:

TDR-62-41, dated June 1963, title:

Flight Evaluation of the Final Configuration of the UH-1B/AN/ASW-12(V)

TDR-64-18, dated July 1964, title:

Evaluation of the UH-1D (48-ft Rotor) Equipped with an XM-6E2 Armament Kit

TDR-64-19, dated July 1964, title:

Flight Evaluation of the UH-1B 48-ft Rotor with Kellett 60-Gallon External Fuel Tanks

TDR-64-20, dated October 1964, title:

Evaluation of the UH-1B with 60-Gallon External Fuel Tanks

TDR-64-28, dated November 1964, title:

YUH-1D (48-ft Rotor) Category II Performance Tests

TDR-64-28, dated October 1964, title:

Evaluation of the UH-1D (48-ft Rotor) with Helicopter Armament Subsystem X193 (2.75-inch Rocket)

The following tests were conducted at the Air Force Flight Test Center by the U.S. Army Aviation Systems Test Activity, and the reports were

published by that organization. It will be noted that report numbers are repeated in a couple of instances, however the date of the reports are different.

USAAVNTA 64-20, dated April 1966, title:

Engineering Test of UH-1D Helicopter with XT76 Power Plant Installed

USAAVNTA 64-28, dated December 1966, title:

Engineering Flight Test of the UH-1B Helicopter Equipped with the Model 540 Rotor System, Phase D

USAAVNTA 65-12, dated December 1966, title:

Engineering Flight Test of the UH-1B 540 Rotor Helicopter Equipped with XM-16/M-5, XM-21/M-5 Armament Subsystem

USAAVNTA 65-22, dated November 1966, title:

Engineering Flight Test of UH-1B Helicopter Equipped with XM-47 Antipersonnel Mine Dispensing Subsystem

USAASTA 66-06, dated January 1968, title:

Engineering Flight Test of the AH-1G Hueycobra. Phase B, Part I

USAASTA 66-06, dated February 1968, title:

Engineering Flight Test of the AH-1G Helicopter to determine the Area of Inadequate Directional Control Power at 8,000 Pounds Gross Weight

USAASTA 66-06, dated March 1968, title:

Feasibility Test of Tractor Tail Rotor Modification on the AH-1G Helicopter

USAASTA 66-06, dated May 1969, title:

Engineering Flight Test of the AH-1G Hueycobra Helicopter. Phase B, Part 2

USAASTA 66-06, dated November 1969, title:

Engineering Flight Test of the AH-1G Hueycobra Helicopter. Phase B, Part 6

USAASTA 67-07, dated May 1968, title:

Analytical Study of Range Performance of a UH-1C Helicopter Equipped with a Lycoming T53-L-13 Engine

USAASTA 67-66, dated March 1968, title:

Engineering Flight Test of the AH-1G Helicopter Equipped with the XM-28 Chin Turret with one 7.62mm Automatic Gun (M-134) and one 40mm Grenade Launcher (XM-129) Hybrid. Phase B, Part 3

USAASTA 68-03, dated April 1968:

Title same as above, Phase B, Part 5

USAAVNTA 68-31, dated November 1969, title:

Army Preliminary Evaluation of the AH-1G (Hueycobra) Helicopter
Equipped with the XM-35 Armament Subsystem (20mm Automatic Gun)

USAASTA 68-37, dated January 1969, title:

Army Preliminary Evaluation of the AH-1G Tractor Tail Rotor
Modification

USAASTA 69-01, dated December 1969, title:

Air Worthiness and Flight Characteristics AH-1G Helicopter
with Stabilized Night Sight (SNS). Phase 1

USAASTA 69-07, dated December 1969, title:

Jettison Test - XM-19/MK-45 Flare Dispenser Installed
in the UH-1 Helicopter.

Following reports were published on the results of tests conducted
with the Air Force UH-1F helicopter:

TDR-64-45, dated June 1965, title:

UH-1F Category I Performance, Stability and Control Tests

TR-65-5, dated July 1965, title:

UH-1F Category II Performance

Test Authority: PD 64-29, dated 22 October 1963

Test Aircraft: UH-1F s/n 63-13142

Test Period: 21 August 1964 - 28 January 1965

Test Hours: 99:25

TR-65-17, dated July 1965, title:

Determination of the Effects of Rotor Blade Compressibility
on the Performance of the UH-1F

Test Authority: PD 64-29, dated 22 October 1963

Test Aircraft: UH-1F s/n 63-13142

Test Period: 17 February - 30 March 1965

Test Hours: 22:35

TR-65-26, dated September 1965, title:

Static Liftoff a UH-1F Helicopter on the AFFTC VTOL Test Stand

Test Authority: PD 64-29, dated 22 October 1963

Test Aircraft: UH-1F s/n 63-13142

Test Period: 13 April - 25 May 1965

Test Hours: 2:55

TR-66-10, dated July 1966, title:

UH-1F Category II Follow-On Performance Tests

Test Authority: PD 64-29, dated 22 October 1963

Test Aircraft: UH-1F s/n 63-13142

Test Period: 2 July 1965 - 25 January 1966 at Bishop, Calif.

Test Hours: 35

TR-68-26, dated March 1969, title:

UH-1F Helicopter Air Inlet Filter Evaluation

Test Authority: PD 68-4, dated 11 August 1967

Test Aircraft: UH-1F s/n 63-13142

Test Period: 20 September 1967 - 17 January 1968

Test Hours: 39.9

TR-69-15, dated May 1969, title:

Evaluation of the UH-1F Helicopter with Thin Tip Rotor Blades

Test Authority: PD 68-4, dated 11 August 1967

Test Aircraft: UH-1F s/n 63-13142

Test Period: 21 February - 27 June 1968, Bishop and Edwards AFB

Test Hours: 48.9

CH-3 and HH-3 Sea King Helicopters

The primary function of the Sea King helicopters is for administrative, rescue, and special air warfare activities. Manufactured by Sikorsky Aircraft Division of United Aircraft Corporation, the CH-3 is powered by two General Electric gas turbine engines, and the HH-3 by two General Electric T58-GE-5 engines.

Both the CH-3 and the HH-3 are 72 feet 10 inches in length, and 18 feet 1 inch high. Speed is 164 mph, ceiling is above 12,000 feet, and the range is beyond 750 miles. A crew of three is required. Load capacity is 25 passengers, or 16 litter patients, or 5,000 pounds of cargo. The CH-3 is a fully amphibious, all-weather aircraft.

The HH-3, known as the "Jolly Green Giant" in Southeast Asia, is an improved version of the CH-3 with increased aircrew capabilities. The "Jolly Green" is fitted with titanium armor plate, self-sealing internal fuel tanks, two 200-gallon external fuel tanks, Doppler navigation system and a high-speed rescue hoist.

There is no record of testing of the HH-3 helicopter at the Air Force Flight Test Center. Since 1965, several tests have been conducted with the CH-3 helicopter, including the following:

TR-65-39, dated March 1966, title:

Category II Performance Test on the CH-3 Helicopter

Test Authority: PD 62-73, dated 21 February 1962

Test Aircraft: CH-3 s/n 62-12577

Test Period: 21 April 1964 - 27 August 1965

Test Hours: 93

TR-67-4, dated July 1967, title:

Range Extension of a CH-3C by Flying in Formation with
an HC-130H

Test Authority: PD 66-83, dated 18 March 1965

Test Aircraft: CH-3 s/n 62-12577 and CH-3H s/n 64-14855

Test Period: 28 November - 16 December 1966

Test Hours: 10:25

Test Flights: 11

TR-67-10, dated August 1967, title:

Determination of the Effects of Rotor Blade Compressibility
on the Level Flight Performance of the CH-3C Helicopter

Test Authority: PD 66-62, dated 8 February 1966

Test Aircraft: CH-3C s/n 62-12577

Test Period: 10 March 1966 - 21 February 1967 -- testing was
conducted at Edwards AFB, Bakersfield, Calif.,
Malmstrom AFB, Mon., and Nemaoy Royal Canadian
AFS, Edmonton, Canada.

Test Hours: 32

TR-68-17, dated November 1968, title:

Performance Tests on CH-3E Helicopter with the T58-GE-5 Engine

Test Authority: PD 66-83, dated 18 March 1966

Test Aircraft: CH-3E s/n 62-12577

Test Period: 23 June 1967 - 12 April 1968 (testing was suspended
during the period of 23 September 1967 - 14 March
1968)

Test Hours: 31:10

TR-68-29, dated March 1969, title:

Simulated Air-to-Surface Tow Tests with the CH-3E Helicopter

Test Authority: PD 66-83, dated 18 March 1966

Test Aircraft: CH-3E s/n 62-12577

Test Period: 25 April - 5 August 1968

Test Hours: not available

TR-69-6, dated April 1969, title:

Slope Landing Tests with CH-3E Helicopter

Test Authority: PD 66-83A, dated 27 March 1968

Test Aircraft: CH-3E s/n 62-12577

Test Period: 26 August - 31 October 1968

Test Hours: 12.3

OH-13 Sioux

This U.S. Army helicopter is a product of Bell Helicopter Company. It was designed to operate in confined areas of the combat zone and has a speed of zero to 80 mph, and a range of approximately 180 miles. The Sioux is 9 1/2 feet high and has a length of 30 feet 5 inches. In addition to one pilot, the OH-13 can carry one passenger or two litter patients, or 400 pounds of cargo.

The Air Force has flown the H and J series of the OH-13.

When first tested at the Air Force Flight Test Center the helicopter was known as the H-13. Three tests were reported by the Center beginning in 1954, and two tests, conducted at the Center, were reported by the U.S. Army. Test reports, date, and title, are shown below:

TDR-54-25, dated October 1954, title:
Phase IV Performance Tests on the H-13G Helicopter

TDR-57-12, dated July 1957 and Addendum I, dated March 1958, title:
H-13H Phase IV Performance Tests

TDR-62-15, dated August 1962, title:
Performance Evaluation of the H-13K

U.S. Army test reports:

ATA 62-13, dated April 1964, title:
Engineering Test Stability and Control OH-13B
with XM-1 Armament Kit

ATA 63-1, dated June 1963, title:
OH-13 Gross Weight Increase/XM-1 Armament Kit Performance Test

CH-21 Helicopter

Used by the Air Force and the U.S. Army, the CH-21 has two names; by the Air Force it is known as the Workhorse, and the Army calls it the Shawnee. The Army uses series B and C, and the Air Force uses series B.

The CH-21 is a product of the Vertol Division of The Boeing Company and is a single engine tandem rotor helicopter. Both series are powered by a Wright R1820-103 piston engine. The length of the fuselage is 52 1/2 feet, and the height is 16 feet. The CH-21 has a speed of 135 mph, and a range beyond 300 miles; the ceiling is above 20,000 feet. A crew of two or three may be used.

The first tests at the Air Force Flight Test Center were conducted with the prototype of the basic design, the YH-21. Later, tests of the C and B series were conducted. The following reports were published:

TDR-53-6, dated March 1953, title:

Phase II Flight Tests of the YH-21 Helicopter

TDR-54-12, dated June 1954, title:

Phase VI Flight Test of the YH-21 Helicopter

TDR-54-12 Addendum I, dated May 1955, title:

Phase VI Functional Development Test of a Modified YH-21 Helicopter

TDR-55-18, dated June 1955, title:

H-21C Phase IV Performance Evaluation

TDR-55-26, dated December 1955, title:

H-21C Phase IV Performance Evaluation

TDR-55-30, dated August 1955, title:

H-21C Phase VI Functional Development Tests

TDR-57-4, dated March 1957, title:

Phase IV Performance and Stability Tests of the H-21B

TDR-60-29, dated October 1960, title:

Safety of Flight Evaluation of the AN/ASW-12(V)
Autopilot Installed in an H-21 Helicopter

TDR-62-29, dated December 1962, title:

Flight Evaluation of the H-21C, HU-1A and HC-34C
Equipped with XM-153 Armament Kits

TDR-63-44, dated April 1964, title:

H-21B Sideward Takeoff Tests

HH-43 Huskie

A small and powerful helicopter, the Huskie can respond immediately. The HH-43F is modified for a combat role and fitted with armor plate around the crew area, engine and the cargo compartment. Its 200-foot hoist cable is equipped with a forest penetrating recovery seat for the survivor.

A product of the Kaman Aircraft Corporation, the Huskie is powered by a Lycoming T53-L-11 engine with 860 horsepower. Speed is 120 mph, ceiling is above 25,000 feet, and the range is beyond 175 miles. The HH-43 fuselage has a length of 25 feet, it is 12 feet 7 inches high, and the rotor diameter is 47 feet. A crew of two is required and it can carry six passengers or 2,500 pounds of cargo.

The following reports were published on tests conducted by the Air Force Flight Test Center.

TDR-59-3, dated April 1959, title:

H-43A System Evaluation with Fire Fighting Kit

TDR-60-21, dated November 1960, title:

H-43B Category II/III Systems and Operational Evaluation

TDR-60-21 Addendum I, dated June 1961, title:

H-43B Modified Empennage Evaluation

TDR-62-11, dated June 1963, title:

Category II Performance Tests of the H-43B Helicopter

TDR-63-19, dated September 1963, title:

Limited Performance Evaluation of the HH-43B with the 60 Degree Tailpipe

CH-47 Chinook

This U.S. Army helicopter is a product of the Vertol Division of The Boeing Company and is powered the Lycoming T55-L-engine. The CH-47 has a rear ramp for straight-in loading and an external cargo hook with a seven-ton capacity. The fuselage is 51 feet in length and it stands 18 1/2 feet high.

The following reports on tests conducted by the Air Force Flight Test Center have been published:

TDR-64-24, dated October 1964, title:

CH-47A Category II Stability and Control Tests:

TR-65-2, dated June 1965, title:

CH-47A Advanced AN/ASW-12 V Stability Augmentation System
Flight Safety Evaluation

Test Authority: Unknown

Test Aircraft: CH-47A s/n 60-3449

Test Period: 27 October - 3 December 1964

Test Hours: 16:50

Test Flights: 15

TR-66-2, dated May 1966, title:

Category II Performance Tests of the CH-47A Helicopter

Test Authority: PD 60-29D thru G, 25 October 1965

Test Aircraft: CH-47 s/n 60-3448

Test Period: 1 October 1963 - 30 October 1965

Test Hours: 83:20

TR-66-14, dated June 1966, title:

IR Suppression Tests

Test Authority: PD 60-29H, dated 25 October 1965

Test Aircraft: CH-47A s/n 60-3448

Test Period: 19 November - 14 December 1965

Test Hours: 9:25

TR-66-46, dated March 1967, title:

Determination of the Effects of Rotor Blade Compressibility
on Performance of the CH-47 Helicopter

Test Authority: PD 60-29 I thru J, 2 February and 16 March 1966

Test Aircraft: CH-47A s/n 60-3448

Test Period: 18 February - 28 April 1966 (tests at Edwards AFB,
Bakersfield, Calif., Ellsworth AFB, S.D., and
Grand Forks AFB, N.D.)

Test Hours: not available

The following three tests were reported by the U.S. Army Aviation Systems Test Activity:

USAAVNTA 66-23, dated March 1968, title:
Engineering Flight Test of the CH-47B (Chinook) Helicopter
Phase D (Interim Report)

USAAVNTA 66-28, dated September 1968, title:
Engineering Flight Test of the YCH-47C Medium Transport
Helicopter Army Preliminary Evaluation

USAASTA 68-02, dated February 1970, title:
CH-47 Height Velocity Evaluation

HH-53 Helicopter

The HH-53 is the largest and fastest rotary wing aircraft in the USAF inventory. It was developed from the U.S. Marine Corps HH-53A heavy assault transport especially for the Air Force Aerospace Rescue and Recovery Service.

Sikorsky Aircraft Division, United Aircraft Corporation, is the prime contractor, and the powerplant is two General Electric T64-GE-3 shaft turbine engines for the HH-53B, and two General Electric T64-GE-7 shaft turbine engines for the HH-53C. Length, with rotors extended, is 18 1/4 feet, height is 25 feet to the top of the tail rotor; the main rotor diameter is 72 1/4 feet, and the tail rotor diameter is 16 feet.

Cruise speed is 195 mph, ceiling is above 20,000 feet, and the range is beyond 550 miles without external tanks or aerial refueling. Load capacity is 38 passengers, or 24 litter patients and four attendants, or 16,000 pounds of cargo. A normal crew numbers five (pilot, copilot, flight engineer, and two pararescuemen), but will vary according to mission. Armament consists of three 7.62mm miniguns.

The HH-53 is equipped with a variable speed rescue hoist and 250 feet of cable with a forest-penetrator device for jungle rescue. It has selfsealing fuel tanks, armor plating, all-weather capabilities, and can land on water.

Although tests have been conducted at the Air Force Flight Test Center and at the contractor's facility by AFFTC personnel, no test reports had been published as of March 1970.

NOTES

1. UCAF Fact Sheet 12-65, "U.S. Air Force in Southeast Asia."
Hereinafter referred to as Fact Sheet 12-65
2. "Vietnam Information Notes No. 6, June 1967," compiled by the
U.S. State Department and published in U.S. News & World Report,
dated January 26, 1970. Hereinafter referred to as Notes No. 6.
3. Ibid.
4. Fact Sheet 12-65
5. Notes No. 6
6. Ibid.
7. Fact Sheet 12-65
8. Ibid.
9. Notes No. 6
10. Ibid.
11. Fact Sheet 12-65
12. Notes No. 6
13. Fact Sheet 12-65
14. Aerospace Information Handbook (Volume III), AFP 190-3, Change 1,
dated 29 October 1968
15. "Aircraft Development" Air University Review, January-February
1969, page 21

GLOSSARY

AFB	Air Force Base
AFP	Air Force pamphlet
AFFTC	Air Force Flight Test Center
AFSC	Air Force Systems Command
ASD	Aeronautical Systems Division
ATA	Army Test Activity
BIS	Bureau of Inspection and Survey (Navy)
FAC	forward air controller
JATO	jet-assisted takeoff
MAAG	Military Assistance Advisory Group
MAP	Military Assistance Program
mm	millimeter
mph	miles per hour
PD	project directive
RVN	Republic of Vietnam
SD	substantiating document
SEA	Southeast Asia
SEATO	Southeast Asia Treaty Organization
s/n	serial number
STOL	short takeoff and landing
TDR	technical documentary report
TD	technology document
TR	technical report
USAF	United States Air Force
VTOL	vertical takeoff and landing

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USAF Fact Sheet 12-65, U.S. Air Force in Southeast Asia.

U.S. News & World Report, January 26, 1970, pages 84-88

Aerospace Information Handbook (Volume III), AFP 190-2-2, 1 June 1964

Aerospace Information Handbook (Volume III), AFP 190-33, 15 June 1967
and Change 1, 29 October 1968

Air University Review, January-February 1969, pages 21-31

USAF Aerospace Speech Series, "U.S. Air Force Operations in Southeast Asia" Number 41, March 1968

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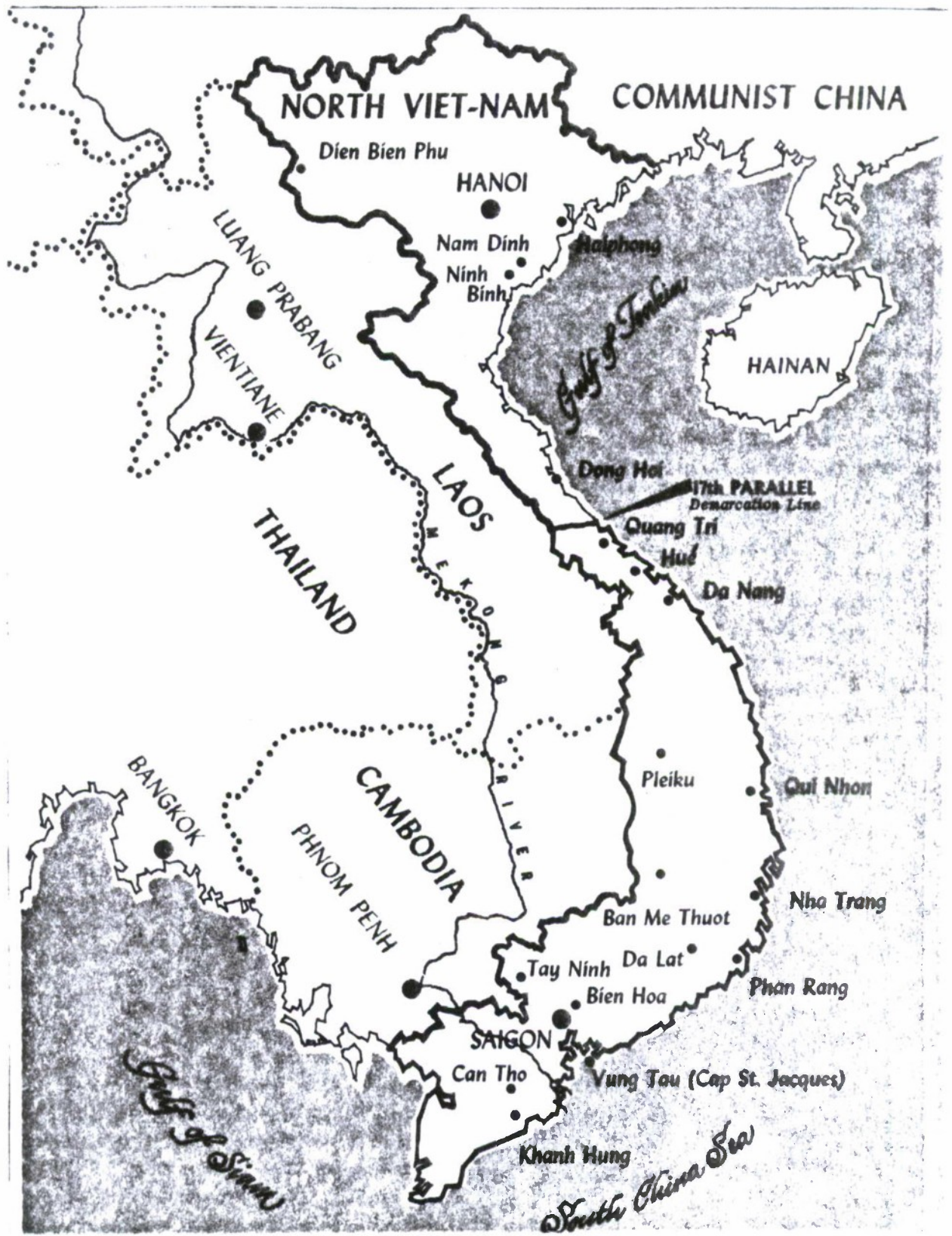
Air Force Flight Test Center Technical Reports, 1965-1968

Edwards Air Force Base Histories 1950

Air Force Flight Test Center histories 1951-1969

U.S. Army Transport School Advance Sheet (Army Aircraft) 610-285,
dated 1 February 1969

Military Aircraft Designations published by Douglas Aircraft Division



MILITARY AIRCRAFT DESIGNATIONS*

A uniform system of designations for aircraft of the U. S. Military Services was adopted a few years ago. New designations were assigned to currently operational aircraft of the Navy, Marines, Coast Guard and Army, while most of the Air Force aircraft retained former designations.

The designations are comprised of letters and a number. The number indicates the design, or model, and the letters indicate; basic mission (or type), modified version, status of the aircraft, and series symbol (each variation of the basic design is identified by a letter, "A" indicates first variation, "B" indicates second variation, etc.) The position a letter occupies determines its meaning.

The first letter left of the design number indicates the basic mission; second letter to the left of the design number indicates the modified mission; third letter left of the design number indicates the status of the aircraft. The letter to the right of the design number indicates the number of the variation of the basic design. For an example, a YRA-3B aircraft:

The "Y" indicates a prototype status for the aircraft. The "R" indicates the aircraft is modified for reconnaissance. The "A" indicates the basic mission for the aircraft is attack. The "B" following the design number indicates the aircraft is the second variation of design number 3.

* Condensed from Douglas Aircraft Division booklet "Military Airlift Designations"

Aircraft Status

G = permanently grounded	X = experimental
J = special test, temporary	Y = prototype
N = special test, permanent	Z = planning

Modified Mission

A = attack	Q = drone
C = cargo/transport	R = reconnaissance
D = drone director	S = anti-submarine search
E = special electronic installation	T = trainer
H = search or rescue	U = Utility
K = tanker	V = staff
L = cold weather	W = weather
M = missile carrier	

Basic Mission

A = attack	P = patrol
B = bomber	S = anti-submarine search
C = cargo/transport	T = trainer
E = special electronic	U = utility
F = fighter	V = VTOL or STOL
H = Helicopter	X = research
O = observation	Z = airship

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